





[Faint, mostly illegible handwritten text in cursive script, possibly a list or journal entry.]

Strophomena
not equal

50-55
59
60-112
127-137
140-152

[Faint handwritten notes and numbers, some appearing to be measurements or dates.]

2 cores per sample,

0-6 inches, more samples

6-18 inches, less samples

0-6 inches in depth of soil per spot.

Monty Fischer

31 W. 8th St. Flat 4,

Fernal Dry Stone

8:30-9:00 PM,

Swind in Race Sts

between Canal & 12th St

Graham Edgar,

at Agricultural Exp. Station

Chemical Aid.

engaged especially in
soil analysis.

Geo. F. Barstow

Chem. Aid of Ry & Gen. Survey.

Terrell.

Joe Hittel at Hamling
knows the country well.

Dr. Stolley, Die Coenobien
und Siphonien Geschichte
Schleswig-Holsteins und ihre
Brachiopoden fauna, 1895,
Kiel u. Leipzig.

Pholidops cinnamomeus Zarsis, Hall.
submarginatus Hall.

Pholidops Roken 1889.

Pholidops ^(?) *columbiana* Walcott,
Proc. U.S.N.M., 1888, p. 441.

transversus Hall.
N.Y. vol. VIII. pl. IV H. fig. 21, 22.

retigera Hall.

laelia Hall.

scabiosa Hall.

minuta punctata

zveialis *gacalla*
percarinata

Salm.

spingera Hall.

retigera Hall.

agilis Hall & Clarke

punctata " "

crumithiota

bradensis

unloyi

crumithiota *unloyi*
aurora

1. Kaiserliche Akademie der
Wissenschaften in St. Peters-
burg.
C. V. V. V. + Schmidt

2) Mickwitz in Rorol

3) Th. Sargant in Lund.

4) Berl. Institut in Königsberg.
C. V. V. V. + Rorol.

5) Palaeontologisches Mus. Breslau
C. F. Rivermer.

14) Prof. Roken. Tübingen.

Mit Grarbus

attached. Crania, vitaceans etc.

Free. *Pholidops*

alone *stimulus*

Attached.

Acc. ant. larger than acc. post.

= *Pholidops*.

Acc. and small than acc. post.

Cramella.

Bauxite.

Hayes, U.S.G.S. 21st Ann.
Rept. pt 3, 1901, p. 435.

Roseleur.

Handbuch der Galvan-
oplastik, 1900. p. 235.
Useful Auto. Perm.

Richards, J.W.

Aluminium, 1890,
Useful Auto.

Minet.

p. 255

Aluminium, 1905.

Useful Auto.

Harvey

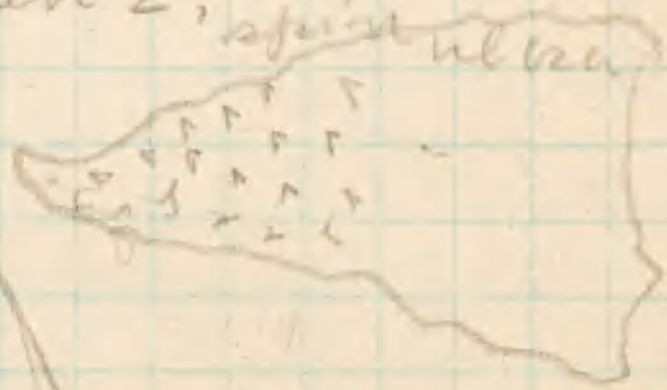
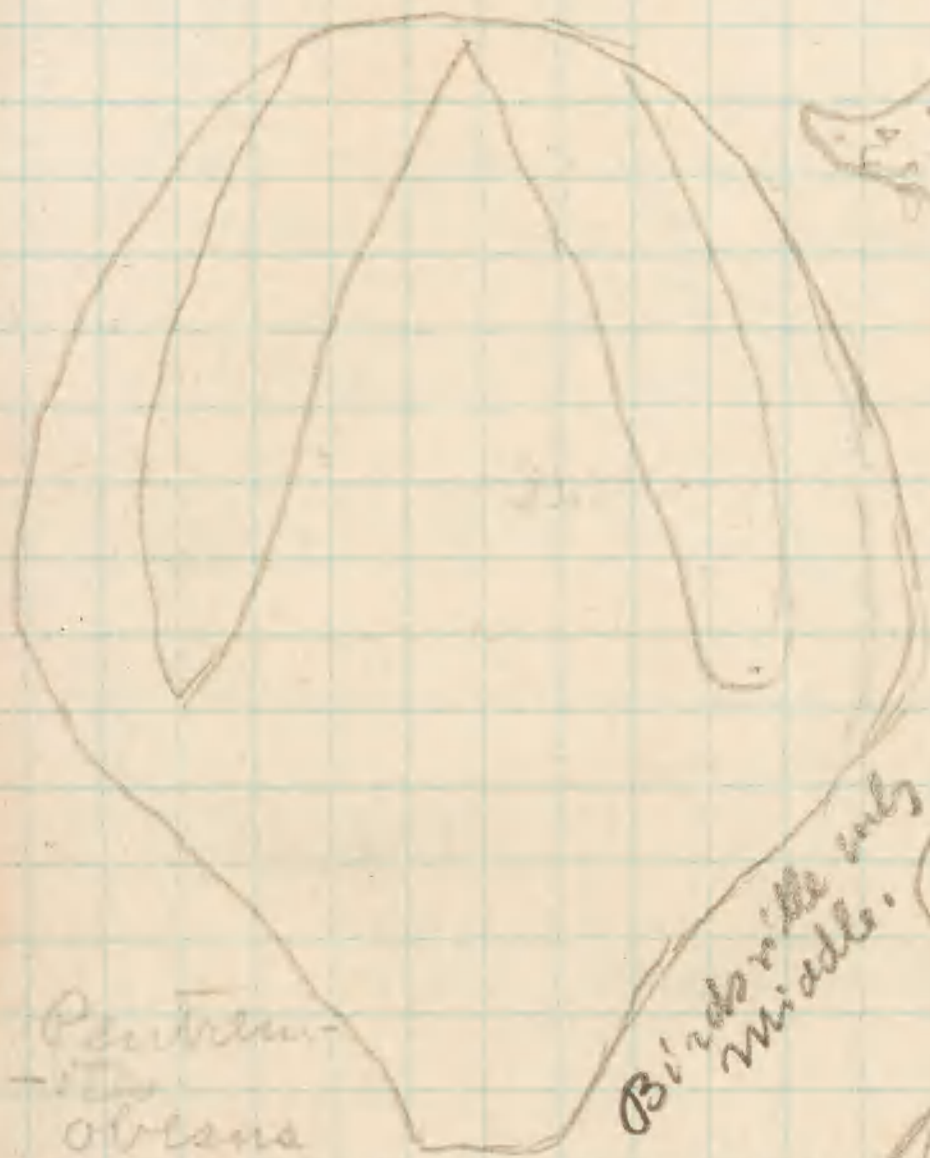
Aluminium, 1885.

Smith Inst. Ann Rept 1889
1889, p. 721

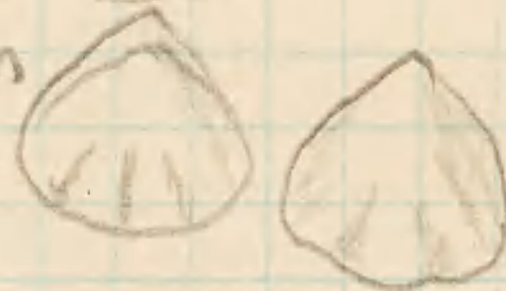
Brearley.

Analysis of Steel
works Materials.
1902, p. 353.

Birdsville, Bed 2, *Zaphrentis*
apiculatus



Camarophoria
notthensis



Birdsville only
 middle.



Pentamerites
pyramidalis



Birdsville only
 middle.

Pentamerites
foliosus

Lysiporia
nickersoni

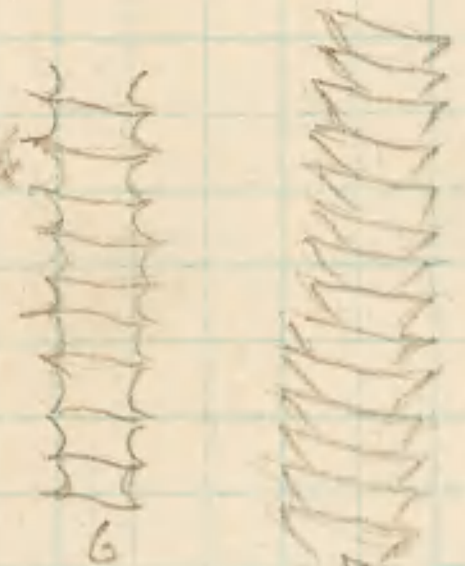
Prismopora serrulata

Beds 4, 6, 9. Chert or fauna. *Bryozoa*
 + *Brachidopoda*

Bed 10. Fossil from the limestone

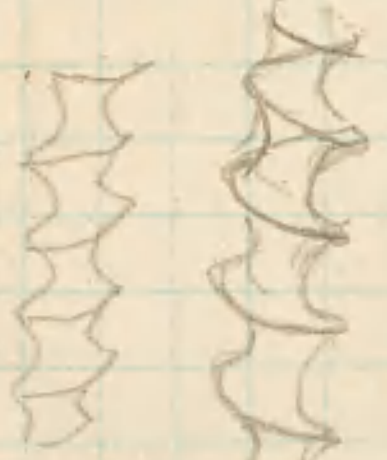
Birdsville, Bed 2

Birdsville
 Rather
 rare.

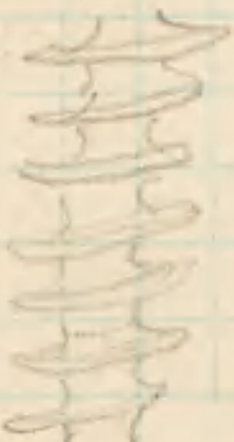


Archimedes
confertus
 Bed 1.

Most
 common



Archimedes
smaller



Archimedes
latior

Archimedes
nickersoni

beginning in St. Genevieve

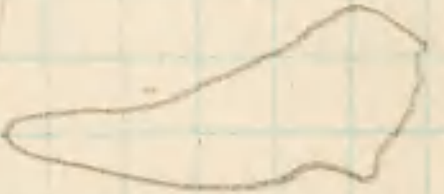
Fredonia tribe



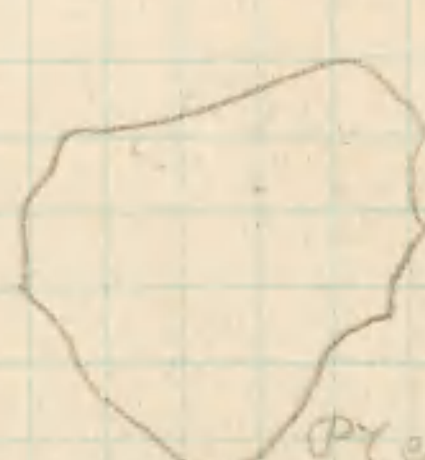
Pterocrinus
 middle



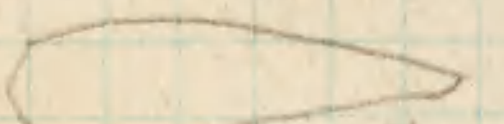
Capitatus



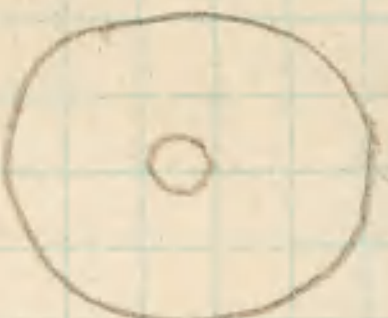
Pterocrinus
acutus



Pterocrinus
depressus



Pterocrinus
acutus



Middle Birdsville
 is most prolific
Archimedes
turbiformis is
 very common.

Birdsville.

Cammarophoria northern. Ind. 11th Ann.

Pentamerites pyriformis. abundant.

Sandstone of Birdsville is more
laminated than that of
Tribune and more massive.

Shales in Birdsville are but with
Cyprina.

Sandstone with thin beds of
limestone in Birdsville
with only thin layers of limestone
and Cyprina.

Birdsville sandstone is a thin top
sandy layer of yellow sandstone
limestone top.

{ Some lithography limestone
some light or yellow Birdsville
more massive than plates that
interbedded with shales and
the shales.

Dark grey or black sandstone
large in area but thin in
Birdsville.

Cammarophoria species can be
Birdsville = 2x in Tribune VIII, 10.

Tribune



Agassizosites
exclusus

abundant in
rare. Birdsville.

Pentamerites
pyriformis.

Tribune, occasional
Birdsville abundant.

Productus fine
ridges. specified.



Productus

Less rare in Tribune
More rare in Birdsville.

Lynceus rare

Lynceus ramosus VIII, 92.

Lynceus linearis - smaller species.

Pentamerites good.

Common in Tribune.

Leptæa 2 specimens in the Archæozoic.

Cypraea



Common on
Tahiti

Pontreuil's garden.
Colima.

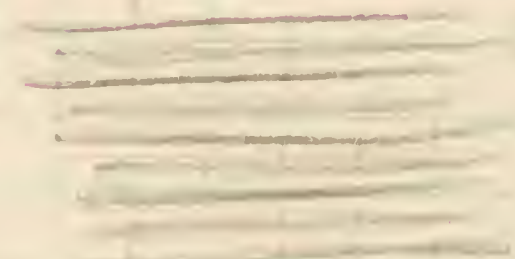


Same
Bridges' Co.

From a Cypraea of
the same

At least one plant in garden

Worthy to be



Large T. ...

3 Cypraea ... small forms
found in ... which are

the ... with ...
Tahiti ...
Colima
Bridges' Co.





Sp. Triceras
 Chama
 Tribune
 Birdsville.

Chama



14

Microblastus
 glaber

Chama
 Tribune?

W. p. p.
 Freddonia,
 aler.

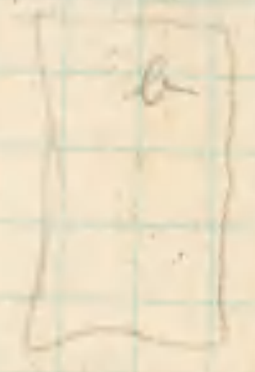


15

Pentamerites
 florealis.

Spargen?

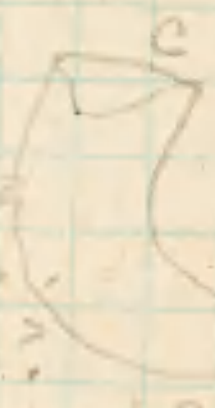
Freddonia
 xxx Chama
 Tribune



b



d



Amplexus
 geniculatus,
 average diam
 less than 5

Must Chama
 typical.

Sp. inferna

in Woodwarda, XII, 9nd.

Sp. inferna to Triceras

also in Birdsville. VIII 49, 35.

Sp. inferna in Freddonia

half as large as in Birdsville.

See end of this section.

5-sided Pentamerite stems common
 R. m. elsewhere.



Sp. inferna Woodwarda

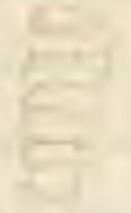
Rosellaria

Calcareous l.
 Fresh - grey to green gray.
 Weathered to redish & very
 porous. Fractured by l. arm-
 mated, lies in l. or l. at
 all angles.
 Very l. in l. or l. at all angles.

Rosellaria
 or
 Front



Frederonia

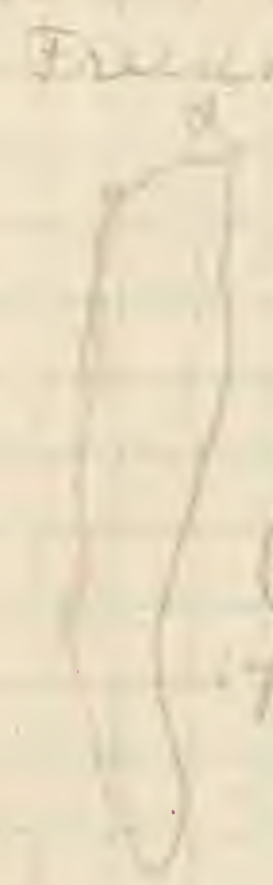


5 sep
 with
 layer
 sec m.
 dary
 septa

Septal line
 2-4 lines

13

Frederonia - l. or l. at all angles



Cylindropora
 or
 l. or l. at all angles



11

Lithothamnion
 l. or l. at all angles
 Most
 common

Murchisonia
 suberosa

Murchisonia
 l. or l. at all angles

Calcareous with l. or l. at all angles
 Could not compare to these

St Louis

Frederick's limestone weathered
for low, sandy,
St Louis weather more
red color.

Heavy black limestone St Louis.

St Louis

Very
fine



x3



Spirifer
in bryozoa

and is a
small, round,
lower

Portulaca
cornea,
lower



Melospiza
multiplex
Lower



Lithothamnion
canadense,
everywhere



Lithothamnion
canadense,
Lower



everywhere

Can. bryozoa, green but smaller
in St. Louisville. Not with a few

Wachleria
much larger.



Synsphaera common. Not found
elsewhere

Trilobite that looking platy
Frederick's limestone platy but here
St Louis chert & rounded nodules

Ponds more frequent.



Species



Belmont, N.Y. 1842
There.

Pinguicula
grandifolia
Spreng.?
St. Louis?
Frederick

Pinguicula grandifolia
Spreng. St. Louis, Frederick



Cystopteris latifolia



Meyer & Son, Providence
Pinguicula nuttalliana



Spreng.
Frederick

Evangelina

Seminole

Cystopteris vera

vernacular etc

Spreng.
Frederick



Evangelina
Meyer to
Frederick

Scutellaria ovata



Blod
in f
Sharon
Frederick

Chama
Frederick
Blod in f



Tullahoma

Abundant in the strata
of fossils

Also in the strata of the
Tullahoma

The Tullahoma strata is
said to be partly of the same

Spirifer

specimen

1857



Rare in Tullahoma

Common in the

Piedmont



Spirifer

specimen

Large in Tullahoma

Common in the

Mead
Breckinridge
Graham sketch
Hart
{ Greene
 Taylor
 Adair
Warren
Edmonson sketch
Trigg.
Lynn
Caldwell
Crittenden
Livingston
Christman. Wall map.

Mendocino 40 ft sandstone Mendocino
15 ft limestone
Cambrian lowest limestone 10 ft.

Payneville the limestone layer
of the Cambrian is absent.

Chert is 53 & usually 25-40 ft.

Coarse gray limestone II. 50
Only in large plot can be seen

at Payneville. Dead Horse
Hollow in west. Ant. Capt.
But the debris on south is
green shale with several in clay coal.

So the

- III. Sandstone, shaly above 350-400.
- II. Limestone 50
- Green shale + coal. 10
- I. Sandstone 25-400.

IV. c. Dark grey with portholes, ~~red~~
b. nearly black
a. Crystalline limestone 25 ft.

b. Shales seen only, Peter Hill at
Huffs or near Payneville.
A mile E of Cambridge
While most of the important str.
Small cones with plants, fossils.

V. Light yellow ss, 60-750 sometimes
slaty. Cops Peter's Hill at Gus-
ton. Also Plateau from Paynes-
ville to + beyond Rhodella,
also N to Concordia.

VI. Bluffs S of Concordia.
Yellow fine grained l. - 30
Oolitic l. pentamerites. Anchinides 60
Yellow fine grained l. - 60
Gray siliceous l. 30
Coarse crystalline grey l. 40
Hard dark grey coarse l. 30
Total 200
Reduced to 100 at Cedar Creek.

VII. Slaty ss. W of creek to Thomp-
son at old Fossil Sigillaria.

VIII. Limestone. Oolitic.
A couple of miles E of Concordia
Also S W of Morleyville

Meads

IX. Yellowish ss. 650

X. Oolitic l. 200

VII. Slaty ss. + Sigillaria.

VI. Limestone, (one oolitic layer) 200.

V. Light yellow ss. 60-750

IV. a. Dark grey l. with Pentamerites
b. Marly shales with plenty of fossils
Pentamerites Anchinides etc.

a. Crystalline l. 250

III. Sandstone shaly above 250-400

II. Limestone 50

Green shale + coal 10

I. Sandstone 250-400.

Section E of Paysonville

	SS — 450 — 450
	Dark grey arenaceous l., with pentamerites 50
Chert	Shale, Archimedes ++ 150 + ulm l.
	Crystalline l. — 250
	Sandstone — 350
	Yellowish l. — 150
SS, —	Green shale + coral — 100
	Grey limestone 100
St. V. 2	Impure friable l. 350
	Colitic in bed of branch 30

15 ft shale above section occurs
in deep ravines on west of town
110 ft below summit of plateau,
connecting with Dead Horse
Hollow. Underlies 300 limestone

Fossils. North

Archimedes intermedius
smaller and
meekanus
Atrypa truncata distinctus
biventa
rossi = sublamellaria
Anisostrophia subida
Fistulifera
Fenestella
Polyspora cestriensis
Productus fastigata
elegans
cestriensis

Pentamerites symformis Meade
cestriensis

Pectya vera
Spirifer lucidus
retigera
Spiriferina trans versa
spirina
Stenopora polymorpha
cestriensis
Saccopora longhedges
Spirifer
Terebratulina formosa
turgida
Zaphrentis spiriferifera

Fine sections at Kings
Landing + at Concordia,

Thompson's store,

St. Louis	{	1500	tc =	
		450	Green shales	Unrich.
		50	Grey limestone	
		300	Br. Clifty ss.	
		600	Covered with chert.	
		100	Eolitic l.	
		1750	Limestone.	

Whirl Fossils Head of Dry
Creek valley 1 mi West of Thompsons
store & 1 mi N of Bennetts store,
Archimedes intermedius
Athyris trinuclea
Cystodictya
Fistulifera excellens
Fenestella
Polysphaera
Productus fastigatus
Clethriscus
Pentamerites godoni
pyriformis
Pentagonal crinoid column
Spirifer bridgii
Spiriferina transversa
Strophomena polymorpha
Zaphrentis spiriferina

SS	500
Gray sand l	150
Crystalline l. oolite	30
SS	120
Y. greenish to gray shales	20
Rough l	10
Fine grained l	20
Limst and sandy	5
Fossils Marly shale	100
Big Cherty SS	500
Limst and to Gr. marl	400

Indian Hill \equiv y. C. Rahampton,

SS ————— 50 ft.

Litchfield in Grogan Co
quarry at top of No 25 Chester SS
written for flagging

1. Soft yellow ss - 10-1500

Big Clifty ss.

overlaid & under laid by
flagging at one sandy

Section:

Sandy shales 100

Massive ss 1500

Sandy shales 100

Sty Very dark crystalline l 100

Blue crystalline l 100

Quarried S of Springfield
Mr. John Wimpss farm, - 600
above St Louis trip.

Shown at Chester, Crystal Springs,
Hudson, east of Rosetta,
east of Bowlingville.

Back of Pierce Big Clifty ss forms
fairly good farms, on large flat
uplands. Moderate crops of
tobacco, grain & good meadows.

Breckinridge

1. b. Limestone 100-350

Heavy bedded blue and
grey limestone, very fossil-
iferous in places.

Occasionally oolitic,

crinoidal

Pentamerites

Lima Archimedes

Productol

Lima tenuicrinital

Archimedes numerous

Hill N of Conitontone

Limestone between Hilltop &
Everleighs Mills on Rough Creek
100 ft above creek.

Runs under drainage between
Frank's Mill & McDevell's

On wages between North Fork
& Calamagor & North
Fork & Jewell's Creek.

at crossing of Hardingsburg
& Bras Pike over Int. River

at Int. River church

at Hardingsburg it is 109 ft
below surface. at gas
well.

Hardingsburg Webster road
across Derridge at 660
across Deer Creek at 710.

Hardings creek just beyond
new school house 4 miles
from Hardingsburg on Stephen
port road. Where creek turns
at right angle = 20° thick.

From Int. River creek on S side of
xxx Sinking creek just below
xxx Little Falls; top 10° above
low water at Stephensport.
xxx Archimedes fossils well
shown

Cedar Grove Landing at base of
hill.

Limestone Cliff on ss at
well on bank creek mouth.

No 2 Sandstone,
 under Breckenridge ss.
 20-60° - 150°
 thin bedded to coarse and
 massive, or as i' mally
 cross bedded.

Stephen pt. 20-250 on
 No 1 limestone,
 On Union Star road just
 back of Bennett Hotel.

Forms surface rock of Preston
 Flats.

Foot region of Breckenridge

Just N of Hardingburg on
 Stephen pt. road, along
 Harding creek.

Section here =
 Sandy shales - 10 } No 3
 Massive ss 22 }
 Marly shales 20 } No 2 LS
 Limestone, or lit 25 }
 Soft ss. with marly sh. 38 } No 2 SS
 Harding creek.

Still

Still better at Hardingburg +
 Mottling road over Clover
 creek to Clover Creek church.

Section here =
 Top of hill No 3 ss. - 20
 Limestone (No 2) with white
 limestone, chert, + red soil - 40
 Heavy ss. 79
 Dark grey l. (No 1) 14
 Bed of Clover creek.

SS ridge on road Grapfield
 just at top of ss.

Asphalt Mine of Breckenridge
 2 mi SW of Grapfield is in this
 ss.

Hardingburg to McDaniels
 after crossing bridge over
 North Fork.

Section here =
 ss 30 }
 Shale thin coal 2 } No 5 ss
 Thin ss 14 }
 Limestone (No 4) - 17
 Covered space 750
 ss (No 3) - 210
 L (No 2) - 48
 ss (No 2) - 32
 Covered 10
 Bed of creek.

No 2 limestone
 4 ft from top of section
 Pentamerites & Archimedes

Road from Mr. D. Smith's to
 Mr. Wells Ford. Shows
 well in "hills" on each side
 of small creek just south
 of Mr. D. Smith's run
 under SS. No 2. In which
 the fossils are found.
 Out croping, as can be seen
 from bridge across North
 Fork,

Just below Falls of Rough

Head of Doddridge at Ephraim.

Top of hill		
SS No 3	25	
Pentamerites	24	
Shales	31	
Buff l	5	
Caliche l	10	
White Pentamerites l	5	
Blue l	5	
Gt Chert	15	
SS No 2	30	
crack,		

} No 2 L

5 ft from top of No 2
 long road.

150	SS	} No 3
100	Thin SS	
5	Black shale	} No 2 L
5	covered	
10	limestone	
10	black shale	
10	covered	
20	limestone	
11	Red & green shale	
15	SS No 2 H	
10	Thin SS	
2	Black shale	
35	L with sh. to	amary
40	Red & green shale	
5	SS	} No 2
25	shale	
25	SS	
10	L	No 1

No 2 L

Mounts of No 2 shown up around
 Union Star, in Mead Co.

amary at Addison.

Farm of Mr. Chas. Filkins on ridge
 between Jordan & Bull creeks.
 Upper part 40' under l.

30' above RR in Bridging Creek
 road out of Clarksburg. Under
 Black shale & No 3 SS.

No 3 SS.

On a ridge E of Union St. Sta.
3 miles N of Union St. Sta.
Top of ridge from Stephens-
burg on Hardingburg road.
3 miles N of New Liberty Church.
R. 10-15 ss. at head of
Shaw's Creek.
R. 10-15 ss. on
Hardingburg I.E. to it across
Shaw's Creek.
Far Springs are at base of
SS No 3. Pine water res. at.

Upper Chester, Above No 3 SS.
Below No 5 SS.
Small area.

No 4 L
brown, No 4 SS
No 3 L

Horseshoe road W of Clarksport,
top of hill.

25	S No 15	
R. 10-40	Mass. B. (B. of) (B. of) (B. of)	
15	Shale, brown, (B. of) (B. of)	
20	S No 4	
10	Grey mud	} No 3 L
20	Shale	
50	Shale	
5	Shale	
5	Shale	
10	Thin ss.	

30-150. Massive ss.

R. fine variegated bedding, red
congl. in ss.

Similar section Clarksport
to Matthews.

No 5 SS

West of 5th of Cleveland
Cape the hill

Dolls of Rump,

500

10

shale

1-3

Coal

30

SS

No 5 SS

40

shale

Limestone

Green mud

Buff li

Limestone

shale mud

No 4 L

60

SS

No 4 SS

45

Gray mud

12

Limestone

15

Green mud

5

SS

5

Limestone

3

shale

10

Limestone

5

shale

50

Limestone

shale

Limestone

shale

No 3 L

High

Franklin

Co.

No 2 L

No 5

Limestone

Along Fiddlers Road

1 mile east of County line

Also near base of Sand

Knobs S E of Cleveland

Graves Co.

School house spring 1 mi S of
Gypsum bed.

Fossil leaves Leognarum. Near foot of
thick facing Mayfield at Boaz.

Boaz. Open prairie.

Red oak + black oak have
sprung up since farming
began. Boaz + the river land.

Gladley land = White salt.

Port Oak + Hickory upland.

Bo. Hill and Cranberry.

Clark Valley Flats.

S of Paducah, S of Eden's hill in
valley + on S of hill 3/4 mi
valley, the miocene ss shows
Eocene fossils. Carter.

Graves Co.

Lignite beds in banks of Panther Cr.,
a little north of Mayfield, on
O. White + O. A. Cr. on hill facing
Boat at White 3 ft above water of
creek. Upper part full of broken
leaves, etc. on

Porter creek map it was. Black clay.

LaGrange Group. Leaf impressions
in clay at Boaz on CO + SW R.R.
in N of county. 150-200'

Anatolian gravel disappears ss of
Lynville + Feliciana
Horsetime + chert fragments.
Round quartz pebbles stained
red. Best seen deep railroad cut
of CO + SW R.R., 1 1/2 mi N of
Boaz etc. Purple clays at base
cut also leaf impressions.

Big cut = 75 ft above water valley +
high near Mayfield = above
Anatolian gravel.

Bo. Hill Cr. to Gypsum on Panther
creek, above Mayfield. 6-80
leaves in upper part.

White pipe clays abundant near
Boaz.

Pile factory at
Hooty station on L + NRR
S of Lawrenceville (W of South Park)
on road to Brooks.

Lawrenceville

Okalma



5 miles to Okalma

Brooks

Livingston Co.

Johnson Co.

Blackfoot	100-175	L,	144-177	I
	173-165	S	120-150	II
Birchville	65-115	L	60	III
315-430	27-75	S	50-80	IV
	40-125	L	68	V
	100-250	S	72-100	VI
Tribune	100-150	L	154	VII
Cypress	60-150	S	150-250	VIII
Oliver	121	Bluff		
Ronaldine	4	"	"	
Fredonia	56	"	"	

Clarksville
stony loam

Soil 6"
light yellow
brown silty loam
chert 20-50%

Subsoil 30
chert 20-50%
Rough country
Apple & peaches

fine sandy loam

Soil 6-15"
fine loose sandy loam
light grey or
orange, loose

Subsoil 30+
red sandy clay
Mixture of Lafayette
sandy layers with
Clay of Limestone
sections.
Surface drainage
good.
Rolling land.
Good for peaches
Cotton etc.

silt loam

Soil 8"
silt loam
light grey

Subsoil
Yellow compact silt loam
Silty clay reddish yellow
or red.
Residual origin.
Barren or Flat woods type
drainage, not for
tobacco, strawberries,
Cantaloupes etc.

clay loam

Soil 8"
silty loam
reddish brown

Subsoil 30
silty clay loam
red, heavy
Residual
Slightly under-
lating.
Strongly fertile
Best farm land.
Tobacco heavy
yield, but not
best leaf.

1 1/2 mi SW of Sugar Creek 2 1/2 mi. N. of Sugar Creek
4 mi. E. of Sugar Creek 5 mi. S. of Sugar Creek

5/4 2 in. cavity - not a pipe - covered.

6. *Yucca elaeagnifolia* (L.) Engelm. (See fig. 10, p. 11.)

2 ft. Chert (iron) 1/2 S. of road.

8 1/2 ft high above ground

17 1/2 ft soft Saline ~~XXXX~~

43 1/2 of 100 = 43.5 and another 10 at 70%

Scrobilicium lobes

52 12 chas. 1. 1/2

2. The same for women. (1924)

2. *For the purpose of the present study, the following data were collected:*

7 H. ...

[illegible]



Sept 10 1904

Geology in section - bed 2 is a sandstone
with large pebbles. Bed 3 is a sandstone
with a large pebble, but small & of
sand.

Carbels & very stable. Shells of corals.

1 1/2 mi S.W. of S. 1/2 of the section is a sandstone.

2 1/2 mi S.W. of head of S. 1/2 of S.W.

Several times a pebble, but small & of sand.

4 ft. upper sandstone layer.

5 ft. 9 in. fairly solid upper sandstone.

6 in. sandstone. The sandstone is a

2 ft. clay sand. It is a sandstone.

8 1/2 ft. sandstone. Sandstone.

47 1/2 ft. soft sandstone.

43 ft. clay sandstone. It is a sandstone.

Tetracium layer.

32 ft. clay sandstone.

2 ft. 6 in. heavy sandstone.

40 ft. sandstone. It is a sandstone.

8 ft. sandstone. It is a sandstone.

31 ft. sandstone.

Walking west of hill & about

5 feet of bed of sandstone. It is a sandstone.

about



52

5 miles Abbotts store to Bedford.

4 1/2 miles to Sligo.

Aldham Landing + Johnson.

Aldham is opposite Bethlehem about 6 mi.

= 4 mi to Jennings store + 2 to

5 miles to Sulphur.

Bedford.

53

At John Morgan's 4 1/2 miles South of Bedford there is a good exposure up to the Upper Asgard clay + down to the lower Saluda at least.

Upper Asgard clay.

5 1/2 Asgard limestone

5 1/2 ft indurated Lower Asgard clay } 20 ft

14 1/2 ft soft whitish Lower Asgard clay

Basal Niagara

Clinton not distinguished separately.

Saluda bed well exposed.

Mt Pleasant

1/8 mile east of Mt Pleasant.

42 ft Lonsdale limestone

Asgard

Saluda

Versailles.

Slightly farther west 1/8 mi east of Mt Pleasant, where road into Johnson farm turns off North there is a glacial quartzite boulder 2 ft in diameter.

Spring on Bedford. Well on Pikeville from which issues at base of Asgard limestone.

Peters Hill Eastern Fossiliferous

Panglossville 300-400 yds below town.

near Clarke's land

William Handley. call up

W H Rhoads at Panglossville

try to find out about fossils

Peters Hill East side,
going up

fossiliferous clay ——— 16½ ft

Disintegrated limestone 2½ ft

Limestone, crystallized above, 23 ft

Unknown interval,

Plenty of sandstone to top of hill

More solid sandstone 10 ft

Shaly sandstone 20 ft

Shaly clay 10 ft

No limestone ——— 10 ft,
clay

Section N of Sample RR station.

Marl

40 ft limestone chiefly,

58 ft clays, near top and bottom shaly near
middle. Rather poorly exposed near
middle

10 ft limestone

26 ft clay marl

34 ft limestone sandy
clay marl

South of Garden Springs

- 53° { Brown, massive sandstone
 28° { Marl, fossiliferous at bottom. Collected
 34° { Very white limestone, oolitic
 22° { Clay with Rhy. fragments collected
 36° { Greenish brown. Fossils collected
 Limestone, some of it fine grained
 Rough creek.

West of Crown Creek Church

- No 3 Sandstone
 No 2 Marl
 No 2 Limestone Fossils collected
 No 2 Marl
 No 2 Sandstone
 No 1 Marl
 No 1 Limestone Fossils collected
 at top.

2 1/2 mi. W of Orchardville, 100 yds
W of junction with Amador Ferry
Road

38 ft sandstone. Top not seen.
4 ft fossiliferous (collected) limestone
87 ft limestone
Pentamerites cornuta

4 mi. W of B. Gulch Green,
along road going off north-
ward from the Bradley pike.

Big Clifty sandstone is
100 ft above Pentamerites limestone
in white limestone layer
quarried at the T. J. Sweeney
quarry by W. H. Sweeney & Co.

59
Directly west of 1209, SW of Sharpville,
Clinton Co., Tenn. 1/2 mi's

Bellport bed,
10 ft clay, w/ fossils, considerable part
purplish.
7 ft 6 in thin limestone + clay inter-
bedded, some of the clay purplish.
Platystrophia collected.

1075-
1010
65-

1030
13
65

1/2 = 5 ft.

Spirifer

leidy² bifurcata
leidy. small.

The distinguishing feature of this form is the intercalation of one plication on each side of the Σ forming the main axis of the fold, and of 4 additional plications on each side of the fold, on that part of the lateral slopes which is nearest the fold.

Also, one additional plication on the lateral slope, next to the one bordering the sinus.

~~These features apparently are not possessed by Sp. leidy.~~

Since the types of Sp. bifurcata do not show intercalated plications, our specimens can scarcely be identified with the latter.

Most of our specimens are distinctly smaller than Sp. leidy.

Listed by Ulrich from Spargen to Birds ville.

Similar specimens with less prominent plications occur in Freedonia

Spiriferina spinosa?
norwoodi?

Our specimens have the surface ornamentation of Sp. spinosa (Hall & Clarke pl. 35) in a general way, but the spines are much shorter, almost granular, and are confined chiefly to the ridges, being usually absent in the lower part of the grooves. In specimens as large as that figured by Hall & Clarke, the number of plications on each side of the sinus usually equals 5.

Our specimens agree with Sp. norwoodi, but usually are not rounded at the ends of the hinge line. The number of plications on each side of the sinus is 6, and this number sometimes occurs also on each side of the fold. The plications are stronger, and narrower, due to the greater depth of the intermediate grooves.

Found in Chas. { Paynesville.
Eg. Hardin Spgs.
Burling Green

Listed by Ulrich under Sp. norwoodi from
{ Tribune & Birds ville
Chas.
Freedonia
Spargen.

Sp. spinosa is listed by Ulrich from the Tribune & Birds ville, and our specimens are much less spinose.

Borne.

1097. Clay. 3 mi W. of Burlington.
thin stratified layers of various
tints of light brownish grey,
and light and colored.

Kent on.

1581. Siliceous Grit. 1st toll gate.
2 mi from Covington m. in
Lexington turnpike. Shales.

1582. Same. used for molding
sand.

1583. Clay. Cincinnatic Group.
Same locality. just below
the grits above.

1584. Clay pit at bridge yard. Head
of Russell street. 9 ft section.
Covington

1585. Marly shale. Junction of
Ohio and Licking rivers. 12 ft
above low water mark.
Cincinnatic Group.

1586. Marly shale. fine shales
between iron lignite beds.
Whitellale. 5 ft above low
water mark. No fossils.

1322. Sand. In gulch along
Columbia Trace, $\frac{1}{2}$ mi NE
of Newport Reservoir.

1323. Sand beneath Bridge Key,
Columbia corner of Harris
St. Newport.

1324. Virgin soil. Upper woods
farm. Gen. G. B. Hodge.
Flat Woods. Waters of
Phillips creek. $1\frac{1}{2}$ mi SE
from Grants Lick.

1325.

Campbell Co.

1315. Mostly shale. Circumvent 170.
 $\frac{1}{4}$ mi from Newport.
Alexandria turnpike. upper
blue clay.
dark grey soft shale.

1316. Most from siliceous sand-
stone. of Dr. Leno. 10 ft from
surface.
Gallons & ap.
3 ft colored friable from sand.

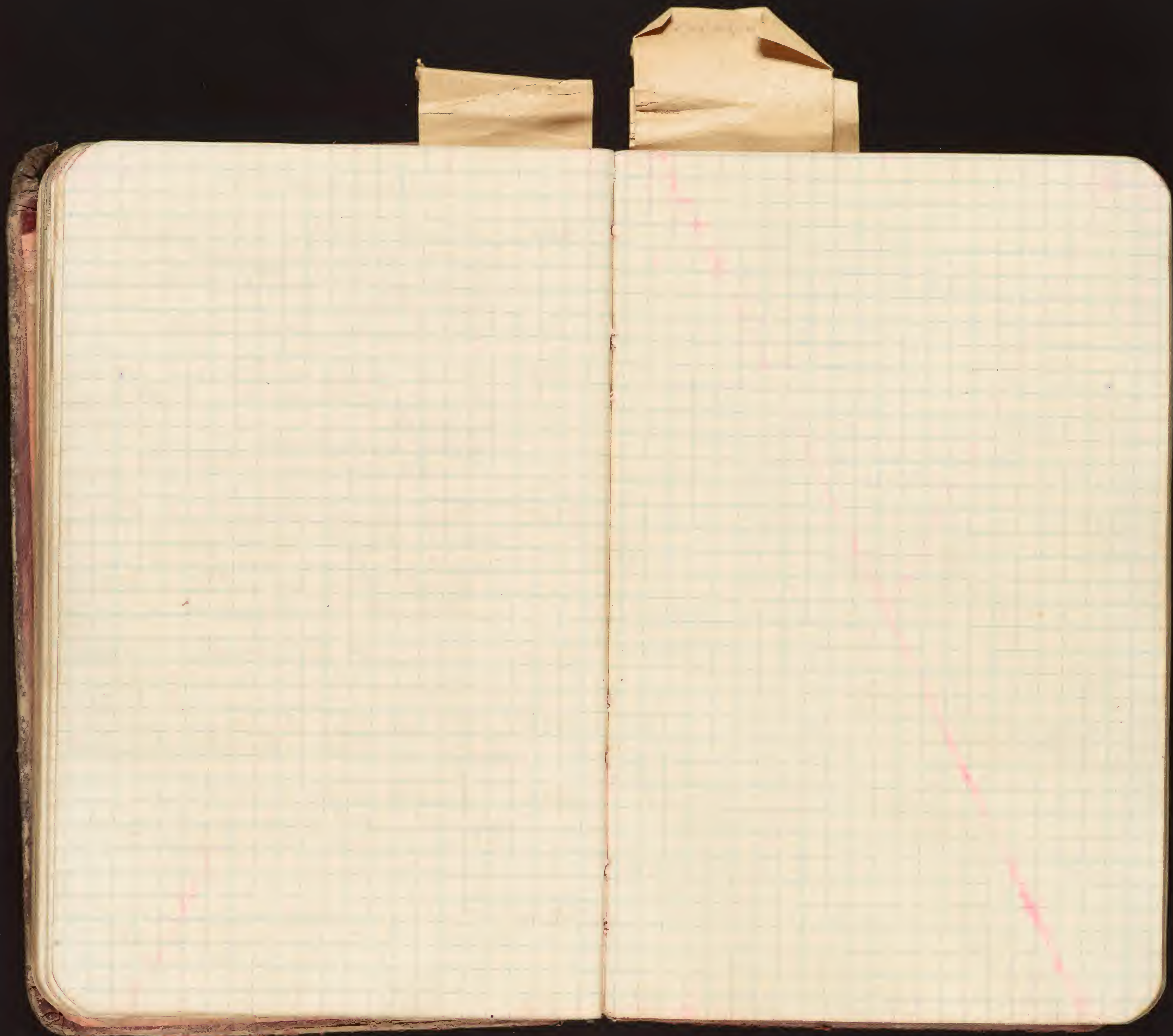
1317. Clay shale. Newport Reser-
voir. 340 ft above river.
6-12 ft from surface.
Clays mixed with a few
limestone layers.

1318. Newport Reservoir.
Upper blue clay, 320 ft.

1319. Bridge clay 3 ft above
larger water mark. Newport.

1320. Sand clay 3 ft from
surface. Not Virgin Road.
 $\frac{1}{2}$ mi from Alexandria
turnpike.

1321. Fertile clay side of
road. $\frac{1}{2}$ mi N of Grants
creek. N head waters of
Phillips creek.



Linderoenda. at Pomona in
 Bygonia. Northern Shan State
 Silurian
 Associated with *Leontium*

F R Carpenter Reed.

Miss G. L. Elles.

Spanta. 40 ft river to top of *Cyntherium*
 1 mi E of Spanta. The
Cyntherium dips eastward
 and up to this point the
 dip was west.
 At Spanta the top of *Cyn-*
therium is 12 ft above
 R.R. station,

82
 102
 184

W. Hope base 82 1/2 ft above bend in
 Calburn Ave. where it is
 joined by W. Hope road.
 98 ft mine down to river bed
 4 ft more down to R.R.,

200
 184
 16

Grand Central 490
 430 In water

82 1/2 ft.
 98
 14
 10
 194.5

60
 50
 10 ft above
Cyntherium

Barnes River section.
 1/2 mile E of Lodge across Beaver R.
 Top of section on J F Hart's land.

43 ft. Loose chert fragments in soil
 along hill top. with fossils,
 including *Spirifers*. but it is
 not known for certain whether
 this belongs to the Hart's dolomite
 limestone. At least no *Rhipid-*
onella sulcata was found.

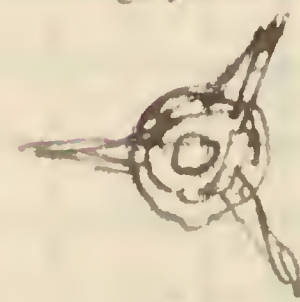
42 ft. shaly argillaceous rock, with
 banded bell-voids and crinoid
 heads near top. This is the upper
 part of the Knoxstone formation
 and resembles it closely.

30 ft. thin shaly argillaceous lime-
 stone. This is evidently merely
 the calcareous phase of the
 upper Knoxstone. If it is the
 representative of the New-
 Providence clay series it
 must have the fossils. This
 part of the section is best
 exposed 1/2 mile east of the
 bridge, at the Big Bluff on
 George McKinnon's land,
 although it is exposed also
 in the Hart's farm.

6 ft. cherty white limestone, ex-
 posed on both farms, but
 at the big Bluff. At some
 localities the lower part of
 the overlying section is less cherty
 causing this more solid lime-
 stone section to appear 11 ft thick.

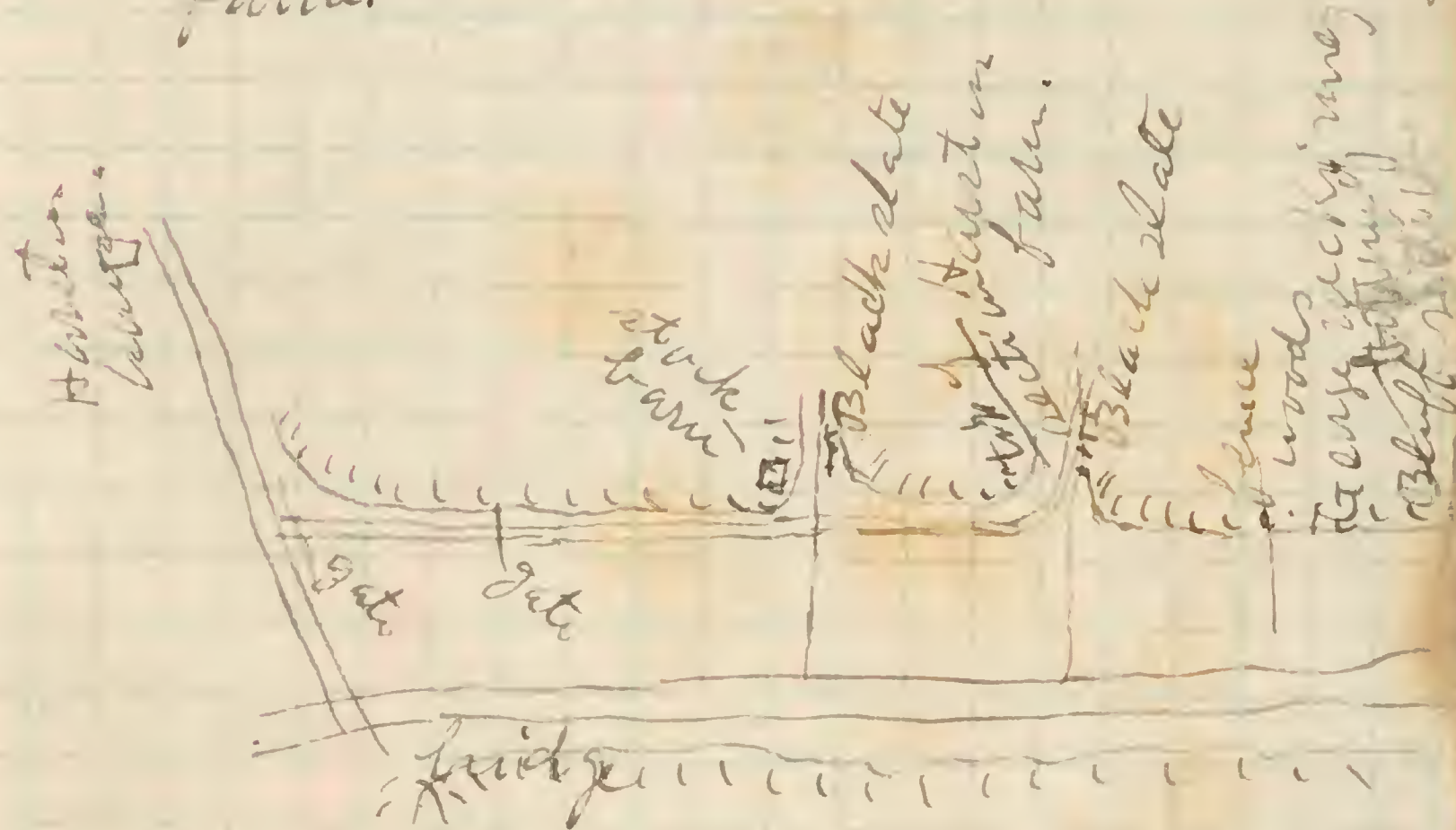
55 ft. Black Chattanooga slate,
 thin, fissile, on George McKinnon's
 farm at big bluff.

8 ft. Brownish limestone, blue
 gray, rather dark, with trace
 of fossils except one *Lance-*
olus about 2 ft from the top which
 contains crinoid stems.



Nothing else recognizable.
 This layer is whitish lime-
 stone.

Any section in George McKinnon's
 farm.



right corner of farm, NW of home
at NW corner of Indian Cem-
etary bluffs $\frac{1}{2}$ mi. east of
Bridge across Trummers creek,
S. into side of creek.

Bare of New Providence,
crinoidal limestone.
Phosphatic nodules several
4 inches diam.

Black shale, about 10 feet
exposed above crinoidal.
Bare not seen.

WC Center. A short distance
south of here is the first
Arthur carbon seen going
S from the Barren river
bridge. A short distance
further south, a road
turns off westward, and
a P.O. box, an arched
road Clark occurs here.

first limestone in abun-
dant, applicable to the
Barren river section. NW
of the Barren river bridge, and
N of the Peters creek bridge,
a short distance = $\frac{1}{2}$ mi.
Arthur carbon occurs at the
S foot of the Lucas hill.
Clay shale occurs above the
limestone. Limestone at N end of
Lucas it self.

NW of station on west side of
Little Trummers creek.
21 ft of crinoidal limestone
interbedded with soft green
clay exposed. Contains
3 species Arthur and Spirifer
as in Barren river bed but
but $\frac{1}{4}$ mi. N of station, at
the R.R. there is a total sec-
tion of at least 50 feet in
large part coarsely crin-
oidal limestone, but
not far from contact in the
Arthur. The Spirifer appears
to be present however,
judging from the presence
of Spirifer in large blocks
of limestone with Spirifer
along the road, apparently
have been quarried out from
the face of the bluff along
the railroad.

1885
45
1840

P4 Pleasant.

George Jerry Delaney

D. Nicholson, Bethe Walnut

Boulder ledge about 4 feet
above the water, 2-3 feet thick
many layers in the boulder
ledge.

Only one ledge of boulder ledge
that was with quarrying,
about 6 in thick. It is as good
as ledge below.

About 3 or 4 good ledges below
the boulder ledge.

One 12-14 ft thick.

Two or three from 3-6 or 7 in thick.

Never quarried the higher
ledges.

Beach quarrying.

Used for building stone,
abandoned of Southern bridge
on 15th St. Occasionally
from boulder ledge. Sinks
& ditches.

Hill quarry worked before
the beach quarrying in 67
it closed & railroad.

Beach quarrying not long after,
some after.

Hills + Hyde park on Madison
road.
Take Madison + Hyde
Park car.

P. J. Delaney, 1768 & McMillan^{W.H.}
North 3379 R.

Mr. Cox first quarrying.

Wayne, Armacost & Bushong
quarry, opened up in
in 1867.

Last quarry in 1887.

Ernest Armacost

footing creek. heavy building

Turtle back come below the
boulder ledge.

Other than below.

New Richmond

beds

Fulton layer 4 1/2 ft with
a few nodules

Cynthiana, Richmond 11 ft
below top about 15 ft
limestone.

Clayey limestone.

At A *Strophomena mayi* Allen's
half a dozen specimens in a
small pocket.

This *Strophomena mayi* is
found also above the 123
foot mark a distance of
50 ft. = 73 ft below O.

Coryville *Rafinesquina nasuta* in
lower layers.

Belted lynx = 22

37 ft *Fairmount* 52 down to *Strophomena*
28 ft *Strophomena* 69-70 { 17 down to *Cynthiana*
5 ft *Strophomena* 5 ft *Strophomena*

12 Mt Hope 17.5 = *Dalmanella multisepta*
common. Call of a specimen.
14 *Plect. plicatilis* loose

Large room.

Rafinesquina nasuta in lower
Cynthiana near the top of
zone of Mt Auburn.

Top of cliff north
Mt Auburn 22 ft. accurate
includes top 10-32 ft to base of cliff

Coryville 54 ft 0-59 ft to top of
0-74 ft to top of floor A
Culvert 0-91 ft to culvert

0-108.5 ft to *Dalmanella multisepta* common
Small *Strophomena* in place

0-123 ft to *Plect. plicatilis* in
to base.

37	52	107	22	59	
					Bittel 930
					160
					1770 above
					474
					326

37 ft To base of Mt Auburn?
28 ft To base, layer with *Strophomena*
22 ft base of floor to *Strophomena*
5 ft base of Mt Auburn? *Stroph.*

White soil. *Dalmanella multisepta*
Cynthiana
Strophomena
Plect. plicatilis

80

drop from Augustin to
Sergeant = 42 ft

475 ft at Mt Olivet - beyond Bethel

42

517 at Olivet mine

137

380 - top of bed

268

140 = base of bed



65 ft from base of massive, stratified
massive limestone to
road - 1 mile E of Lexington

Number was 300, 300 - 300
directly beneath

81

6 mi S of Brooksville on road to
Mt Olivet. N of bridge.

Trinucleus + Plectambonites above.

34.5 Limestone = Nicholas, from 3.5 to 38
ft. ft above bridge across Camp Creek.

7 mi. S of Brooksville at bridge
across N Fork on Mt Olivet road
NW of bridge

Dalmanella emacrata not common
15 ft bryozoa at several levels

72 Plectambonites abundant at top.

72 6 ft interval

Large Dalmanellas

66 ft interval.

Bridge level.

20 ft interval

North fork level.

No sign of W. d. beds
here. What does this mean?

Stratified in the river

at least a school house 2 miles
out from Brooksville.

at Brooksville 3 1/2 miles S. with a
road bridge at 1/2 mile

at 1/2 mile 4 1/2 miles S. 1/2 mile

at 1/2 mile 4 1/2 miles S. 1/2 mile

at 1/2 mile 4 1/2 miles S. 1/2 mile

at 1/2 mile 4 1/2 miles S. 1/2 mile

at 1/2 mile 4 1/2 miles S. 1/2 mile

82

mt
Holly

East F

East

83

clover

clover

Poplar

Bent Am

Poplar

NW
Betha

Poplar

Betha

84 Enter? in above river. The plank
from Dan's mill.
Plectatthis neglecta found in the
pl'icatella!

15 ft of loose of loosely cemented sand
in the river bed 15 ft in place. In upper 10
feet is *Strophomena multisepta*
in common. In middle 5 ft. below
this is mostly *Strophomena* with
some *Strophomena* in the lower
is not found in these 2 *Strophomena*
beds. There is then *Plectatthis*
found in upper 5 ft. of upper
bed. The lower part of the section
is not clear from *Strophomena*. A medium
large *Strophomena* suggesting *Strophomena*
found along with *Plectatthis*
but not well exposed.

250 ft to base of ledge, with *Strophomena*.
37 ft to crest
33 ft above RR bridge.
320 ft total above RR bridge.
60' crest
380 ft above river about.

Dan's quarry, Conn. O. Near
Appalachian. *Plectatthis* on
front St.
Newport 6-12' from 340'
320'

Country Club upper end of Reservoir,
Pleasant Hill Middle of "
Newport Reservoir, lower end "
Strong Point E of here is *Plectatthis neglecta*.
West of here is *Strophomena* at large.
Northward and below, *Strophomena*
is abundant.

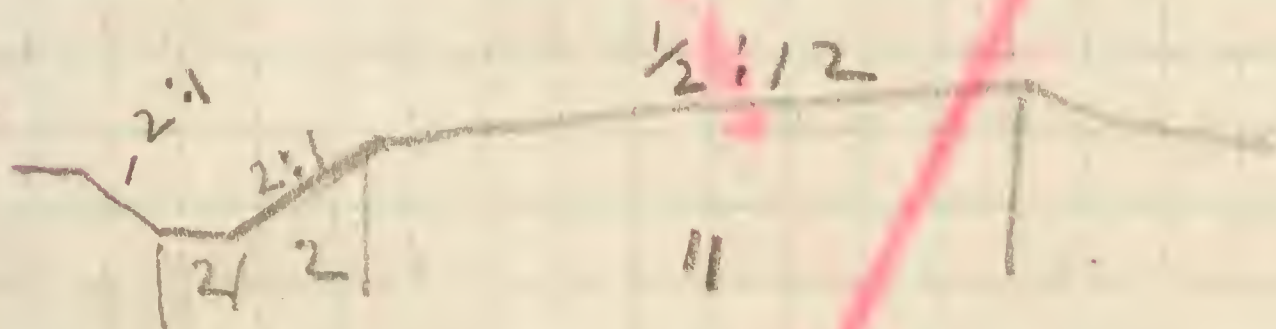
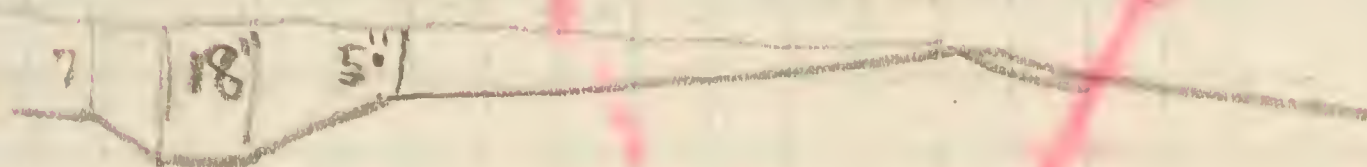
Screenings - $\frac{1}{2}$ in + less.

Steam roller + crusher.
Proper drainage.

Rolling of earth foundation.
Macadam broken stone.

Screenings for binder.

Consolidation with steam roller.



Minimum longitudinal
grade = $\frac{1}{2}\%$.

Bottoms of 2' should be paved
with cobble stone and under-
drained with tile.

Width of road run less than
15 ft. but when ditches, better
22 ft or more.

Side slope not over $\frac{1}{2}$ in 12
so that ditches will not follow road.

Drag + wheel scrapers in stead
of Wagners where leveling does
not exceed 200 feet.

Shuart grader, a common good
machine for leveling up.

On the best earth road ply $\frac{1}{2}$ in
great a load can be carried
as on a good macadam road.

A short 8% grade is all right
as economy.

2% 3% is better if it can be
secured cheaply since this
is angle of repose of wagon
and better than can be
done road.

Ditches wide enough for
drag a wheel scraper.

Small roads

Gravel should be screened
so as to secure even distribu-
tion.

Some crinoids
elevators
rotary screen
drums,
small dump cars,

The binder + steam roller
make it possible to run
under with 2 in. log.

Smaller rocks passing thru
 $1\frac{1}{2}$ in screen are likely to be
larger than $2\frac{1}{2}$ in screen, the
former should be used for
lower layers + latter for top.

Screenings = $\frac{1}{2}$ in + less

10% screenings necessary to
mix with binders.

Surface tension does the bind-
ing.

dust is necessary for third
binding. along with water
capillary action.

Wrinkling is necessary for
binding.



bins for ready handling with
and special loading.

Sprinkling of screenings.

1 crusher 4 ft 6 in with rotary
screen \$1000

Portable bins 200

1 15 H Perseus 200

1 20 H P Perseus 600

12 wheel scrapers 500

12 drag scrapers 1000

2 steam graders 1000

2 steam drills 500

1 15 H P boiler for drills 400

Water + steam pipes for drills 300

2 spraying machines 500

1 10 ton steam roller 2300

Outfit \$6900

90

stone up to 3 1/4" round

Provide turn into 4 ft by
every 300 ft. 16 ft wide
9 ft. much more power
than for the rest.

91

Blended Clay Bricks

Top of Eden at east end of exposure

Zygospira concinnatissima, large
from base of Mt Hope, about
4 ft above base. Residue in
holes like small Plectyrrhynchus
Calymene of smooth form. The
4 ft above base

Strophomena planumbona and
not numerous here, associated
with Cyathophylloids very deep space
characteristic of Mt Hope. near
13 ft above base.

Strophomena planumbona large.

Strophomena planumbona with
rather long beak and valve maybe
a marginellid type.

Plectyrrhynchus rather larger than
normal Leptorhynchus

Cyathophylloids with duplications

Range in Bell Point

Up to 60½ ft above base of section
 D. multicaulis is abundant.
 At 60½ ft up str. magnificaria Crin-
 oidea up to 62 ft in 1½ ft limestone.
 Then there is a little clay and then
 limestone up to 66 ft, cont. in-
 cluding the str. multicaulis. This
 includes a 5 ft Stenogyrellus occu-
 tion at level and must be called
 the base of the Fairmount.
 Dalmanella multicaulis is common
 at the top in no other abundance.
 The limestone is broken and
 cross-bedded. None of these lim-
 estones with Stenogyrellus in
 multicaulis could very coarse
 occur ½ ft higher up.
 7 ft magnificaria coarse
 grained limestone.
 Gray speckled area of magnificaria
 is now found 5 ft further up.
 72½ ft above base of section.
 84½ ft thin bedded limestone and
 clay layers.
 106 ft up is bottom of vertical fall.
 Strig. sinuata in large
 beds below this. Could not
 have come from below 106.
 113 ft up is probable horizon of
 Strig. sinuata.
 133 ft up of road at foot of

Bellaria 22 ft.
 Fairmount 11 ft to base of cliff.
 ii 20 ft interval.
 Strig. sinuata horizon.
 83½ ft 7 ft interval.
 base of steep falls.
 38½ ft interval.
 7 ft Stenogyrellus

83½
 23
 60
 50
 10

Bellaria
 31 ft interval
 — Str. sinuata
 46 ft interval.
 7 ft Stenogyrellus

4½
 1½

94

S Lebanon

0-22 ft up Plect. plicatella common, especially towards top

27 1/2 zyg. lim cinnamomeum common,

39 1/2 Plect. rather crasser than intermediate.

41 1/2 Plect. rather crasser than intermediate.

51 1/2 Rather more clay than expected in Belleme. = probably top of Fairmount.

62 1/2 Clay bed. Plenty of Rafinesquina - good part broken but not broken up. Also some large Plect. at base of overlying section. In lower part nearly jagged. In multi-section.

62 1/2 - 74 ft. In middle abundant clay bed. Rafinesquina abundant with a few nautilus.

74 to 86 ft In top of section with Raf. abundant but there is a clay here.

86 to 88 ft top of section More clay.

95

thinly bedded above,

72 ft of Coryville.
Wt Auburn,

Top of section
Wt Auburn 20 ft.
Coryville 72-74 ft.
Belleme 23 1/2 ft.
Fairmount 62 1/2 ft.

50 ft { 3 ft base of Coryville.
23 1/2 ft Belleme.
22 1/2 ft top of Fairmount.
40 ft Fairmount.

92

Washington, D.C. March 13/19

92

Wabong

3' *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

Waisburg. near March 1911

A { *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

B { *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

C { *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

3' *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

{ *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*



clay 14 in

{ *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

{ *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
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{ *Strophomena* *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*
Strophomena *planumbona* *Strophomena* *planumbona*

160

Stroph. planumbona

260 m

Stroph. planumbona

12 m

F *Leptacma* common,
Stroph. planumbona large,
Plat. verruculosa 3)

12 m

(Partly exposed)
 (Plat. common in some layers)

102 m

X *Hebertella* in a layer common
 total range not known 24 m

N of Calcutt 254,

A loose sandstone unit here
 comes from Liberty bed.

diam. 2.5 in, dipping to 1.5 m
 near margin of shell
 5 chambers in 1.8 in length.

101

(Not exposed)

42 m

Leptacma common.*Dalman. ingosa* rare*Oryz. pul. acutellata**Stroph. planumbona* large*Stroph. dispersum**Pectinea papillata**Hebertella occidentalis*

16 m

G

Stroph. retorta several*Dalman. ingosa* common

10 m

Stroph. dispersum common*Leptacma* common

H.

Platystrophia *Waynesville* type*Stroph. dispersum* 1 m

12 m

*Stroph. dispersum**Crustallaria* large*Platystrophia* *Waynesville* type*Hebertella occidentalis*

42 m

Leptacma common*Dalman. ingosa* not rare

12 m

Leptacma common

8 m

interval

36 m

Dalman. ingosa *Waynesville* type

12 m

Interval

30 m

Calcutt 251. rock in creek

Interval

30 m

Dalman. nodulosa 6

6 m

Interval

66 m

code 100

Ballston section

- 8 in. Massive mottled l.
 24 in. 1/4 - 1/2 ft. massive
 6 in. massive l. with vertical
 worm borings
 17 in. Weathering thin bedded l. in situ
 or fossils
 18 in. thin bedded but hanging together
 and appearing massive
 62 in. Thin bedded shaly clay rock, no
 fossils
 54 in. not well exposed - clay with large
 nodular clay rock masses.

A 72 inches. clay rock with *Tetradium* at all
 levels, abundant in lower 18 in. and
 between 3 and 5 ft. / 5 ft. 1/2 ft. vagans,
 flat byrgones. *Spongia* near 1/3 from top.
Byssonychia Versailles form, *Rhynch. capax*
Eudiceras 1 3/4 in. diam see next page.

B 18 in. *Tetradium* larger, for upper 6 in.
 the underlying 12 inches is thin bedded
 with byrgones thin. Both form the
 "massive" layers. 4, 6 in. diam.

C 18 in. *Calapocia* 6 in. diam. *Spongia* near
Tetradium rare at base.
Columnaria alveolata typical small
F. p. formid.
 Large *Columnaria alveolata* 14 in. from
 top

in. chiefly
 Columnaria large Columnaria
 at various levels, from
 base, at least 7 specimens

level.

ceras 1 3/4 in. diam,
 15/16 in. diam.
 from margin of shell,
 less in 1 3/8 in.

Cephalaria

Ballston section

- 8 in. Massive mottled l.
- 24 in. l. & exp. m.
- 6 in. massive l. with vertical worm borings
- 17 in. weathering thin bedded, ls. with no fossils
- 18 inches. thin bedded but hanging together and appearing massive
- 62 in. thin bedded shaly clay rock, no fossils
- 54 in. sh. not well exposed = clay with large nodular clay rock masses

A 72 inches. clay rock with Tetradium at all levels, abundant in lower 18 in. and between 3 and 5 ft. / Stript, vagans, flat byzans, Spurge new 1/3 from top, Byssonychia Versatilis form, Rhyn. capax Eudocera 1 3/4 in diam see next page.

B 18 in. Tetradium layer, for upper 6 in. the underlying 12 inches is blue limestone with byzans the sh. Both from the "massive" layer. G. bon deni.

C 18 in. Calapocia 6 in down. Spurge new Tetradium rare at base. Columnar alveolata typical small, Ioph. formidabi, large Columnar alveolata 1 1/4 in from base

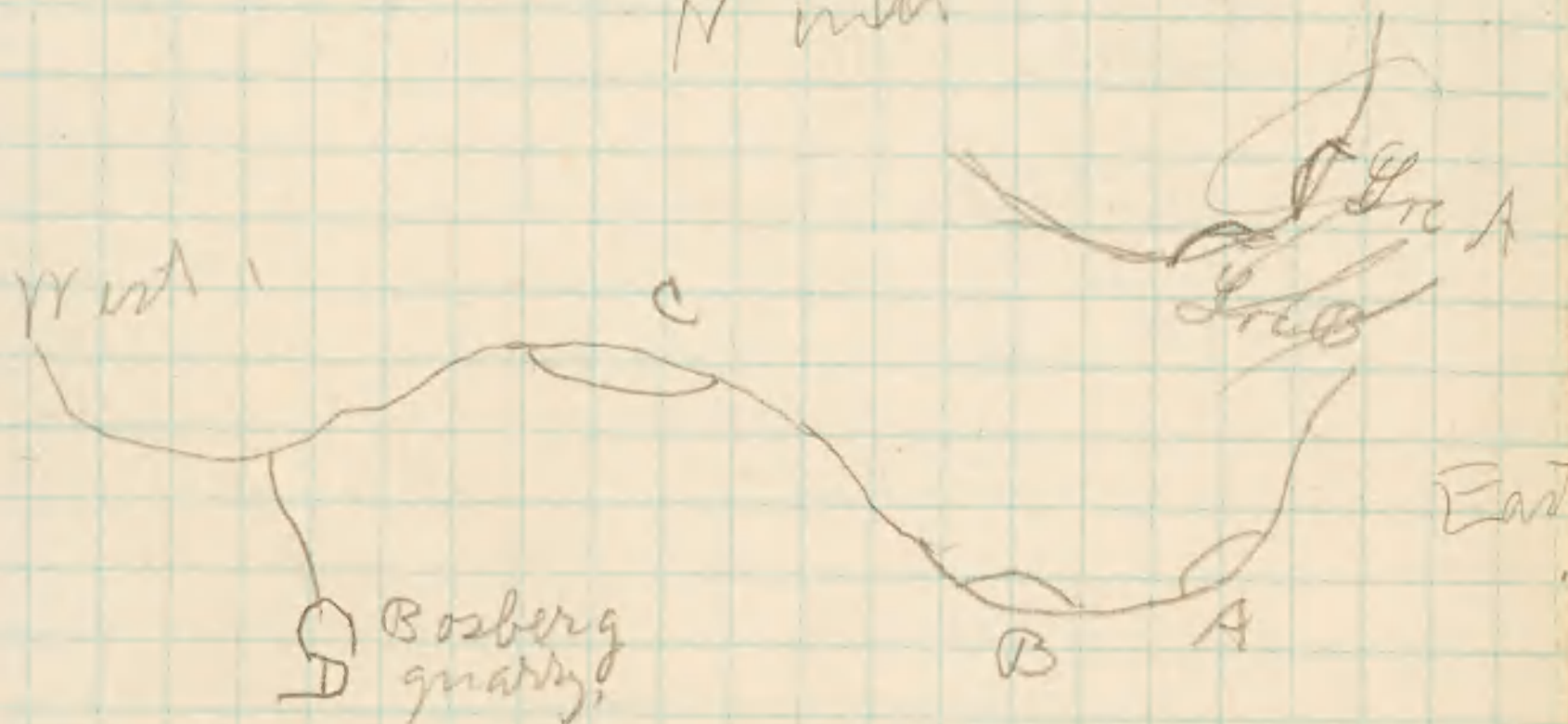
going down chiefly

33 in / 5 toply. alveolata large Columnar alveolata at various levels from top to base, at least 5 specimens seen

crack level


Eudocera 1 3/4 in diam, siphuncle 15/16 in diam 2 1/4 in from margin of shell, 5 chambers in 1 3/8 in.

Loc C, N side of stream
W of Balesville 1 1/2 miles
Balltown
N with



5 ft (Inner White water)
Platystrophia Hebertella
Streptodonta, Streptoragones
bryozones numerous
probably 1/2 exposed

5 1/2 ft more solid mottled l. Zosterophora
Ctenodonta

5 1/2 ft more massive mottled l.
Ctenodonta =  Zosterophora

17 ft silt bedded mottled l. fossils
in distinct.

1 ft 2 in of massive l.

2 1/2 ft to base of second massive l.

1 1/2 ft Tetradium mass bed.

2 ft. clay & clay rock.

Columnaria alberta layers

Bosberg quarry Loc D.

(The Bosberg quarry is 16 feet
deep, chiefly in shale layers.)

(only basal part seen)
1 ft. ~~medium~~ bryozones white water

11 ft with large ones brought to top
tip of mottled l.

3 ft Pterinea dermissa medium. Inedite
Tetradium. Ctenodonta
Orthis acuta smooth. Mottled l. section

13 ft not well exposed.

2 ft. Bryozones common collected.
3 ft. Massive l. of mottled series. Bryozones

2 1/2 ft not well exposed

29 ft tip of shale bed down to
creek near base of Tetradium
layer A.

East of Ball's Run, 4 mi.

(Numerous bryozoans and broad
shells & trilete corals likely due to
the shale layers with exposed
further up the creek, eastward.

- A. *Helostella occidentalis* distinct.
The main rock below *Diploporites*
B. Massive layers with *Petrochilus* at top

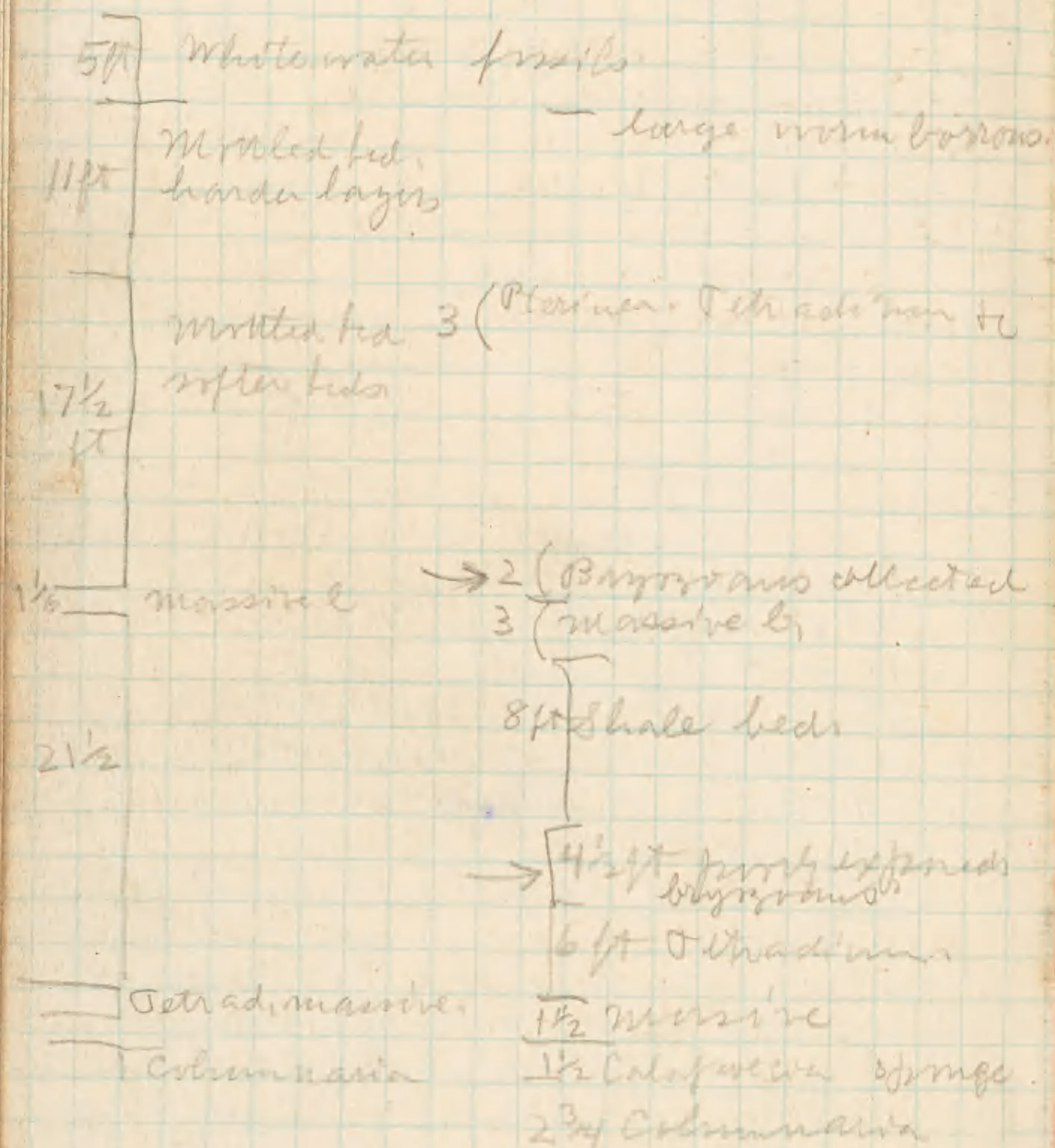
- C. *Stroph. retorta*, *Pterinea lamellosa*,
L. bradleyi, *Helostella pycnostoma*,
in regular layers but in thin
deposits. *Diploporites* & *Stroph.*
Calymene, *graptolites*
Hypophylloids - *Spongia* seen

Little

- 1 ft. massive rock,
12 ft. shale but
5 ft. top of massive layer
1/2 ft. less massive, irregular.
4 ft. massive *Pterinea* and

The bryozoans and other layers
much up the bank & part of the
part of section. *Orthis* *lamellosa*

Put together section at Batesville



Down stream from Batesville bridge
west side of creek, about 1/2 mile

- l. boulders with Tetradium from
- 1 ft coarse grained bl. l.
- 1 ft 6 in. more solid arg. l.
- 1 ft 9 in. more solid arg. l.
- 3 ft 9 in. clay thin bedded rocks with the regular shale bed.
- 5 ft 6 in. thin bedded l. but not the shale bed.
- 5 ft 6 in. lower ones, about 3 in. thick layers but not the shale bed.
- 3 ft 6 in. thin bedded l. but not the shale bed.
- 2 ft 6 in. thin bedded l. layers
- 5 ft 6 in. creek level, creek level.

Artibeus hammondi 15 ft above creek

0-4 ft above creek is Physiculus, Stroph.
Voluta, Pterinea, etc. large, etc.
small, etc. etc. etc. etc. etc.
etc. etc. etc. etc. etc. etc.
etc. etc. etc. etc. etc. etc.
etc. etc. etc. etc. etc. etc.
etc. etc. etc. etc. etc. etc.
etc. etc. etc. etc. etc. etc.

3 mi. N. of Enochsburg bridge
on E. side of stream

- 10 1/2 ft. Sandstone. Small pieces of fossils.
- 1 ft. 6 in. shale with top of fossils.
- 4 ft. 6 in. clay with Petriodonta, etc.
- 1 ft. 6 in. shale with top of fossils.
- 6 in. layer of Petriodonta fossils.
- 2 ft. 6 in. clay with small fossils.
- 6 in. layer of Petriodonta fossils.
- 5 ft. 6 in. shale with small fossils.
- 4 ft. 6 in. clay with small fossils.
- 8 ft. 6 in. shale with small fossils.
- 4 ft. 6 in. clay with small fossils.
- 1 ft. 6 in. shale with small fossils.
- 4 in. layer of Petriodonta fossils.
- 10 ft. 6 in. shale with small fossils.
- 3 ft. 6 in. shale with small fossils.
- 24 ft. 6 in. shale with small fossils.

Cedronia. Wooded area. Small pieces of fossils.

3 mi. N. of Enochsburg bridge. Small pieces of fossils.

East of Enochsburg bridge

- 4 1/2 ft. Lake shale bed
- 1 ft. 6 in. shale
- 1 ft. 6 in. shale
- 5 1/2 ft. clay with some large Petriodonta fossils.
- 2 1/2 ft. Petriodonta fossils.
- 2 ft. 6 in. clay with small fossils.
- 6 in. shale with small fossils.
- 2 ft. 6 in. clay with small fossils.

~~1702-1703~~

2

Monday;

C.

M. H. L. Smith

Aug 1st

11/2

2/11

1/2

1/2

1/2

1/2

1/2

1/2

1/2

1/2

1. Small anticline on W side of river.
2. A small stream runs out rapidly from beneath sand talus about 1 foot above low water level. Evident, an underground stream.
3. Water drops thru sand at river level thru Fryburg sand bed.
4. Heavy flowing spring = underground stream 60 ft above low water in river.
5. In several hundred yards the water comes out of rock near river level thru Fryburg sand bed near 300.
6. At 3.30, stream in bed. Max Run
7. At 4.00 PM.
8. At 4.30 PM. Cold spring and outlet south of Fryburg stream, rather large, plunges down steep cliff. Probably from same source as the one in the north. See spring in the north directly above and named Fryburg spring.
9. At 5 PM. Heavy stream. A small stream from the west. Probably from a spring in the sand source of the Fryburg.

10. At 5.30 PM. I run and see a short distance down stream water is taken down from cliff.
- 10 1/2. Underground stream empties here.
11. At 5.45 PM.
12. Heavy stream, underground?
13. At Brown's Vista, immediately S of church. The Candorville bed is well exposed. The top of the Highbridge is a chert layer 2 inches thick, at 866 U.S.G.S.
14. Chert top of Highbridge 2 inches chert, with Candorville exposed 10 ft higher up to 10 ft above.
15. Chert top of Highbridge 1 in. chert, with remains of Candorville directly above near 950 U.S.G.S.
16. Top of Highbridge and base of Candorville at 865, just N of U.S.G.S. 860 mark. From this in stone fence. The chert layer at top of Highbridge is not actually exposed but the other two are seen within 2 feet of each other, vertically.
17. At top of hill along road side, on West is bed of the Fryburg. On East side, is a large and common = near 990 U.S.G.S.

18. Near point the ground contains round chert, or quartz, concretions like those from Knoxville.

Before reaching bend of road, there is a coarse sandstone limestone like Lexington. At bend of road towards North, there is fine grained limestone with numerous thin layers like High Bridge. Tetradium fragments common. Surface indurated.

Farther along the same road is stuff that looks like sand. It is mostly a fine grained, or mediumish, there is the limestone thin layers. This is shown up beyond point where road turns NE. About 100 yds. N. of this point in field west of road, there is a white dolomite. Apparently the rock east of this dip is a much brecciated limestone.

This white dolomite runs approximately N + S. On the eastern side, where the road turns off NE, at the point already mentioned, and from there to the point where the road makes its last turn toward the North toward the house, Black Shale is exposed. It is a strong southward.

East of the point where the road starts North for the house is Saluda like sandy clay rock, not indurated but friable. Saluda. No fossils, apparently.

Farther south good exposure. Probably some sandstone, or limestone, with plenty of striae. Some dolomite also.

calcareous concretions.

Going from the sink pond SE, the house south eastward along the stream running east of the railroad cut, the limestone with Platystrophia found ^{at Saluda} below the argillaceous clay rock containing the same fossil (Platystrophia) and above this is the argillaceous clay rock without fossils.

Going southward along the stream east of the main fork, there is a strong western dip, extending eastward as far as the first main ridge east of the stream, at the top of this ridge, southward, Black shale is exposed, apparently. I did not go to see it, but judged from the distance.

19. Farther south near the point I have marked 19, straight east of a house on the eastern side of the fork, there is a sudden eastward dip for about 30 ft west of the stream, and then the Black shale suddenly appears, apparently east of a fault. Is there a synclinal structure at the south end of this stream between the house and the first ridge east?

Going from 19 NW up the bank, Strophomena hemisphaerica occurs high up SE of the house, along the path leading to the wire fence.

The bank material directly west of the fence consists of an argillaceous rock which I assume to be the Keokuk stone. This rock forms the main bank.

Directly west of the bank there is a thin layer of limestone which I assume to be Lexington but I don't know. I assume a fault directly west of the bank.

- 20 Before reaching 20, where the creek east of the main bank approaches the country road running east from the pit, the rock slopes east. Then the Black slate is seen sloping NE. Below this, eastward, the non fossiliferous Pseudo Saluda shows up, either horizontal or sloping gently west.

A short distance SW of 20, directly east of the first house south of the junction of the expressed country road with the pit, there is a quarry, reaching all the way from the road junction in here. Heterotella brevis is abundant 4 feet above the base of the quarry. The underlying rock is in limestone, is very irregularly bedded and rests on 3 feet of very fine grained limestone with numerous concretions, which resembles the High Bridge rock in general appearance. The great abundance of Heterotella is against

← Perryville bed

the High Bridge age of the underlying material.

21. Heterotella brevis is crystalline limestone are.

22. Pseudo Saluda sloping westward.

23. Fairmount bed, good but low exposure on N side of road.

Large flat Strophomena. Zygospira. Heterotella. Oxidantella or depression at back. Platystrophia peruensis. Strophomena myanensis. Conostrophia florida. Cyclonema late spine. Strophomena crustacea. Hilli Eschsch.

24. Large depression, like a limestone sink in Fairmount limestone. Another smaller sink occurs limestone SE.

25. Top of fairmount bed. Platystrophia peruensis. Monticulites rudis. C. Heterotella crustacea or oxidantella overlaid by thin shaly unfossiliferous limestone late layer.

26. Quarry in Fairmount bed, 25 ft high. Strophomena myanensis. C. Conostrophia C. Platystrophia. Pterinea without anterior tooth. Posterior tooth not exposed. No late layer exposed.

37. On the west side of the bridge the
Laramie rocks again under the High
bridge. On both cases no trace
of the Cretaceous is seen.

38. Large sink in left in Laramie and a series
of small ones on right.

39. Upper Fairmont. Little *Orthocephalus* layers,
Hebertella occidentalis common.

Orthocephalus typical.

Plat. ponderosa not common.

Platystrophia small form common.
815 ft if bridge level is 804 as
shown on the bridge, but I
notice the new map says 824.
Took up pencil map.

40. Rock resembling Talc layer for
about 20 ft above road level.

Plat. ponderosa rare at base.

41. Upper Fairmont.

Hebertella occidentalis. *Plat. ponderosa*
Orthocephalus in beds north
of road.

42. Talc layer sloping eastward gently.

28. *Plat. large*. *Hebertella* very flat.
Partially above Talc horizon since
the latter is exposed SW down the old
pike valley.

43.

Argillaceus blue l.

Plat. ponderosa. *Hebertella occidentalis*
Hyporhamphus.

913 ft Covered by hard rubble blue l. } 40 ft below
H.S.G.S. *Leptaena rhomboidalis*. } level of road
at lowest
band in road

Orthocephalus dentatus!

Platystrophia of *Cyclonema* form typical.

Hebertella occidentalis!

Platystrophia ponderosa occurs also higher
up than the *dentata* + *Leptaena*!

Covered by clayey rock.

Underlain by clay + thin layers of hard
shaly sandy rock.

The level at the road corner where the
house is 953 U.S.G.S.

44. at 911^{U.S.G.S.} and for 10 ft above *Platystrophia*
Cyclonema is very abundant. This
belongs over solid blue limestone
and is overlain by thin bedded
shaly layers. The *Ammono* below
still higher.

45. Same abundant *Platystrophia*
ponderosa layer with base at
935 and with top at least as
high as 955 U.S.G.S.

Stanford.

46. Mayville. *Platypandora* not common in an *argill. limestone*. Quarry is about 10 ft deep, 970 U.S.S. reading obtained by using barometer. and therefore subject to error.
47. Argillaceous rock. apparently, with *Plat. pandora* but no good fossil.
48. At 894 about, U.S.G.S. *Plat. pseudana*, *Debetella occidentalis* + one *Debetella*, *sinuata*. Apparently also one *Prasopora*. Regarded as Mayville.
49. Fairmount quarry. *Strophomena mayvillensis* abundant.
50. Fairmount. *Strophomena mayvillensis*!
51. On summit S of 51. is Devonian chert, with *Plat. lynx* mixed with chert at base as though the Devonian here had rested directly on the upper Mayville.

North of 51. is typical Eden with *Plectambonites* common.

Dalmanella common only in a few layers, rare elsewhere. *Strophomena* *halleri* rather rare. *Plectambonites* not abundant. Eden rests on about 50 ft. of Fairmount. Eden + Mayville probably E + W. or S + W. S.W.

52. Eden with 2 specimens of *Trinacrens*, also *Plectambonites* + *Dalmanella*. Rather numerous *limonites*, on both sides of the road.
53. Top of High Bridge with *Vannoyella* in chert at top. Also *Orthis*. Large specimens suggest the base of Cayasville bed. Above this is the basal part of the Cayasville, not well exposed. At 885 is top of High Bridge, U.S.G.S.
54. High bridge top occurs at a level = 885 U.S.G.S. in woods along the road before reaching 54. The barite vein at 54 branches irregularly, but the main vein is generally runs a little east of north, but not straight. A little zinc blende is associated with the barite. The High Bridge + Lexington occur west of the vein. The contact rock east of this vein was not exposed at time of visit.
55. Lexington l. quarry, with *Phylloporina magnifica* rare. *Debetella borealis* only one. *Prasopora* two sp., about 10 ft. below top of barite = 950 U.S.G.S.
56. High Bridge at least 45 ft above creek, not measured. Lexington above.

154

78. *Heterella brevis* common.

79. *Heterella brevis* +

Rhynchotrema

80. Before reaching last house on left,

Perryville bed is exposed

At 80 is seen hard limestone with concretionary masses, assumed to be *Murchisoni*.

Eden blocks have slipped down hill.

81. A great Eden section could be worked out SE along the road, and up the various hills.

The basal part of the Eden is very sandy and like thin bedded sandstone.

The middle and upper part has much reddish limestone with

Atrypa + *Plectambonites*.

This basal sand Eden is significant

and possibly has been mistaken

for West Hope by me in the last part

of 4 days trip.

(9

One mile N of Roland.

Leptaena + *Heterospuria* in upper Lynx beds.

Dark blue with gastropods.

Shaly rock without fossils (10-15?)

15 ft clayey. Plat. Lynx.

3 1/2 mi SW of Mitchellburg. and 1/2 to 3/4 mi East of James Whitehouse is house of Sanford C. McCarty.

Black shale

Der. L. - 9 1/2'

Ordovician bed.

3/4 mi East of last B. C. Edwards west of house.

Der. L. - 6 3/4'

Hard siliceous limestone - 5'

Strong dip.

Junction of Mill Creek + Scrub by house at James Whitehouse, NE of house.

Der. L. - 13'

Ord. - 10' - 12'

→ Fossil Ord. - farther down hill.

82. Plat. ponderosa, Helvetella, abundant
Lophospira ponderosa in considerable
sections of the upper, dark col-
ored limestone, Mayville upper.

83. Plat. ponderosa in argillaceous
limestone, Mayville upper, up
to 950 level.

84. Plat. ponderosa, Helvetella, Zygospira, Helvetella, byzans
murex, in blue rubble lime-
stone. The Plat. ponderosa is abun-
dant and many fine. The shell and
large size. Probably not Auburn.

85. Sandy shales. Probably Richmond,
down as far as creek level, up
for 50 ft on hill side, about.

Clinton base, along gap, 37 and
Int. level = 69 ft. ^{crs} ^{clay rock} massive
Several *Strophomena*, probably *Strophomena*.

5+ *Ptilodonta*

5+ *Columbina vacua*

Helvetella ^{along creek}

Platystrophia small.

This is the *Columbina* horizon
of the Richmond.

Interval 40 ft. sandy, 20 layers
crossing of weathered rock.

86. Devonian chert abundant, including
Phillipaster.

In stream bottom is rock lithologi-
cally like that at *Columbina*
horizon.

87. Black shale well exposed, with great
quantities of Dev. chert below.

88. Thin edge of Black shale with Devonian
chert and below and Devonian
from here to road. The Devonian incident
rests here in the Clinton.

89. Thin bedded rock (*Ptilodonta*?) thin for.

90. Fossils abundant, especially *byzans*
+ *Platystrophia* - *Columbina*?
Bluish clay rock weathering as to
expose rather numerous fossils,
among them good *Leptæna* + *Ambonyx*.
Dark colored limestone like that
at loc. 82.

91.

Fossils numerous. *Ambonyx*?

Platystrophia

Interval shale colored limestone, with
crossed with *byzans* = 20 ft?
Layer with *Platystrophia*.
Dark colored limestone like loc 82.

92 Clay shale & shaly rock.
 1/2 ft clay with pyrograna = *P. clausen*?
 1/2 ft. limestone, thin with fossils common.
 Fossils in clay rock 1/2 ft.
 Plat. ponderosa fairly common. 2 ft.
 Internal. Fossils in clay rock. 5 ft.
 Septena in place.
 Internal 1 ft. fossils in clay rock.
 Dove colored limestone 5 1/2 ft.
 Clay shale rock, 17 ft.

93 Top of Dove colored limestone &
 base of *Murphy* is 946 USGS.
 This gives 40 ft. of section up to
 road corner. The lower *P. clausen*
 consists of shaly clay rock.

94 Dove colored l. = *Mayville*, since crossing
 the pike.

95 Dove colored and argillaceous lime-
 stone = *Mayville*. Fossils few.

96. Argillaceous limestone - *May-*
ville Plenty of it in creek.

97. Top of *Mayville* L R
 35 ft shaly l. lower *P. clausen*
 8 ft. with Plat. ponderosa at top. Rubble
 1 ft rubble l. with *Septena* at top.
 5 ft Dove colored shaly limestone.
 50 ft shaly limestone at top of hill.

98 = Continuation of 97.

114 35 ft = highest point of hill = 2nd hill.
 79 7 ft Top of heavy arg. l. with rubble l. below.
 2 ft. Heavy arg. l. bed.
 27 1/2 ft. Internal. Shaly l.
 < R

Second visit.

43, 10 ft Thin shale rock, *Her. eropoda* at top.
 10 ft ~~not~~ not exposed.
 2 ft. *Leptæna*. *Rhy. dentata* exposed.
 S-5 1/2 Dove colored *Leptæna* fossils.
 16 ft. shale rock. mit *Anthon*.
 6 ft. Shale rock. Plat. ponderosa abundant.
 7 ft. Shale arg. l. partly dove colored.
 Plat. ponderosa

The Plat. ponderosa layer with
 abundant *Leptæna* is seen
 up to 8 ft above layer S.
 And abundant *Leptæna*
 seen 2 1/2 ft further up.

Several large globular *Præopora*
 occurred here in road bed
 about on level with horizon
 between *Leptæna* & *Præopora*
 underlying *Leptæna* horizon. They
 probably were not eroded from
 here, and their actual location
 is unknown.

Lower Cambrian

99

The Ambony fossil part is mostly above this level. From white, top of hill. 10 ft. 20 ft. Ambony. Plat. panderosa common. 18 ft. road corner to top of massive rock. Mostly above Ambony.

According to calculation, the Septeria should come in at 21 + 29 = 50 + 920 = 970 ft U.S.G.S.

84) At this locality, Plat. panderosa is abundant up to 965 ft U.S.G.S, and from this point down 10 ft (955 U.S.G.S). The rock looks like Mt. Auburn horizon. The heavy limestone comes in at level of house, Northward. Many of the Plat. panderosa are of subreticulate type.

- 100) Massive blue limestone, Mayonville, Ky.
101) 2 ft. Bryozoa abundant. Richmond base.
5 ft. Pl. panderosa. Top and top.
6 1/2 ft. Septaria, Pteryg. dentata. base < 944 U.S.G.S.
4 ft. Solid limestone.
16 1/2 ft. Shale, rock.
8 ft. Plat. panderosa abundant. Mt. Auburn.
18. Not above.
Creek level. 916 U.S.G.S.

102. Along S. on this road from Gilbert Creek, the Mt. Auburn is soon exposed. The gray shale + solid limestone bedrock exposed for a greater part of a mile. Then comes the Ambony. Ambony is 4 inches above base, which is 2 ft above the base. Plat. panderosa is very abundant. This is indicated by the light gray clay with numerous bryozoa at base of Lower Richmond. Several coarse Columnaria vacua partially buried down from both sides.

The base of the Ambony fossils horizon. 920 ft U.S.G.S. anything along road about 1/2 mile, but as accurately as the instrument permits, up to 40 ft above Richmond base the rock is shaly and the Columnaria is found in situ.

103) So. Shen Church
11ft 5" from top of road bed
Sept. 1891. Amherst base.
base about (951-15) = 932 ft U.S.G.S.
judging from contour lines only,
probably 22 1/2 ft
Base of Mt Auburn shale Plat
found in horizon
Dip about 10 ft.
Stream bottom.

104. Plat. found in 1200 Amherst
base at about 860 ft U.S.G.S.
judging from contour lines only.
If the top of hill is 938 U.S.G.S.
then the top of the Amherst
base of the clay layer at top
of Richmond is at 901 U.S.G.S.
York up final copy of US
map.

at the new road corner west the
mark is 916 U.S.G.S. at about 8 ft
probably correct.

105. 894 ft U.S.G.S. = base of Amherst
Rhy. lentils.
Most of the section down to creek
probably is composed of same rhy. &
limestone. No fossils in it
to creek level. Only Mt Auburn fossils

This would place the top of the Mt Auburn
at about 874. The 1200 Amherst is exposed
but was not measured. The base of
the 1200 Amherst Plat beds should be
at about 866. The undulating section
was not measured but probably is
near

Between ~~894~~ and ~~874~~ and
the creek is at 849 ft. U.S.G.S.

The exposure in the bank cliffs and
northward along the road includes
only shale rock.

10. The cliff at 10 consists at base of
clay rock, 8 ft exposed, cut across
Here Septena is present in lowest
6 in, and Plat. found in is
present in highest layer contain-
ing Septena.

This places the base of the Amherst
bed at 848 ft U.S.G.S.

The old exposure at 10, west of the
road, is formed by the top of the
Amherst.

North of the house N of 10, the hard
limestone below the Amherst is
exposed up to 7 ft above the creek.

The base of the Amherst may be
several feet farther up.

9) Regional blocks of dolomitized limestone
stone not definite. Not abundant.
9 ft. soft, clay, Plat. goniatites abundant.
5 ft. soft argill. sh. Plat. goniatites.
5 1/2 ft. rather hard. arg. sh. with Plat.
goniatites.

196, A pressure anticline with
fractured top, runs N 5 E.
This pressure ridge crosses the
stream east of the R.R.

107. East of R.R. Septoria on
part of Cornucopia. At track level,
 about 6 ft up to Cornucopia
 cones, increased along
 the base. The top of the
 the Septoria NE of R.R. and

108

15 ft 2nd layer at top of Hill
2 ft 2nd layer with few *Spirifer* at top
64 ft Columnar layer down to top
of Antrim bed. as far as I
could judge from exposures down
creek. This does not take into
account the distance and dip
which in this distance is con-
siderable. The distance is
200 yds. Columnar rocks
are *Spirifer* and *Spirifer*
thin bedded with shaly ex-
posed top showing the layers
- South of the Columnar
beds you show up first of all
the *Spirifer* and *Spirifer* com-
es up in weathering.

109. From the creek up to road corner
westward at 109, The base of
the Platy. *Grindelia* Mr. Auburn
is 103 feet below the road
corner. This = $950 - 103 = 847$
The correct number may be more
860 since the outcrops were
taken along the road for at least
1/4 mile.

110 In town (Yamcaster) is exposure of
shale, about 5 feet thick, brownish
fossiliferous *Amheim*, below which
is a blue colored *l. Amheim* base = 100

III. Broad level in sag between two low⁴⁵ rises or "hills".

Internal 5 1/2 ft. basal part light
blue, full of bryozoans - base of Rich-
mond. Upper part = shale, belong-
ing to Richmond.

But in this is widely fructiferous
young = *Arundinaria* with *Plat.*
found on a rather common
and with me from *Leptocarpus*.

Below this is dove colored line
at the

Below this is shale rock.

The Mt Auburn is not to join
here

112. From loc. 45 down to bridge the
Coryville is represented by dark colored
and argillaceous limestone with
very few fossils, near the base of
the section the rock is more shaly. - Date

Massive argill. limestone
5 1/2 ft. Suberose limestone.

(16 1/2 ft shale bed. Date)
4 ft. Suberose limestone.

16 ft. 4 ft. Suberose limestone.
5 1/2 ft. Shale layers + harder ends.

1 1/2 ft. Fossils few.

5 1/2 ft. Orthocephalus abundant.

< 817 U.S.G.S

15 ft. Suberose. Covered layer.

River level.

113. A good argillaceous limestone exposure
about 11 feet below road level at
road angle. Top at 885 U.S.G.S. No
fossil zone visible.

109. road corner 957 probably, U.S.G.S.

56 ft including Ambrose at base.

Leptaena. near base 1901 U.S.G.S

5 ft dark colored limestone.

7 ft shale bed.

878 > 15 1/2 ft. Shale bed. Coryville, Pl. ponderosa.

16 1/2 ft. argill. Coryville. Lower part shaly.

5 1/2 ft. shale. Date?

Creek.

114. Church level top of hill to point on
27 1/2 ft interval.

Base of shaly fossiliferous section
with Plat. ponderosa. Not Ambrose.
The distance to Coryville section.
Base of Mt. Auburn limestone at
965 judging from contour lines -
rather a poor method.

115. Quarry W of road, clay spalling road
regarded as Upper half of Richmond.

116. road level.

18 ft interval.

Leptaena

3 ft dark colored l. < 945 U.S.G.S.

7 1/2 ft argillaceous shale (thinning)

6 ft Mt. Auburn. Pl. ponderosa.

Coryville arg. limestone.

982

901

945

117. Fossil horizon from creek level, up 5 feet.
This is overlain by a shale section, horizon unknown.
Southward, up the hill, is strongly tilted rock, dipping S to E.

118. Road corner.
10 ft interval
5 ft. Rhythmic stratification + Platypendium.
2nd horizon with Platypendium.
Considerable dove colored, below indicates that the overlying fossil rock is Ant Antium.

119. Top of hill.
22 ft interval
Base of exposed Ant Antium
(The latter is about 5 ft thick and is overlain by shale)
Plenty of Corynella arg. l. + dove-colored, beneath down the hill.
One lower point at the creek, is shaly. for a considerable section.
The Richmond and Ant Antium does not reach this point west.
Shale. Partly exposed
10 ft Ant Antium. partly exposed
50 ft Corynella.
22 ft shaly < Creek level.
10 ft shaly.
Stone 4 seen

120. Chert nodules and quartz pebbles occur along road side. Possibly they are found also in the rock. Did not take time to look the matter up.

121. Orthorynchella horizon.

122. Orthorynchella horizon. N of home, south of large oak tree along road.

123. 77 ft Not exposed to top of hill ^{NS 6 S.} 1000 ft
27 1/2 ft shale rock. Fossils layers < 900 about
3 rhythmic stratification
13 1/2 ft massive rock. < 884 NS 6 S
Orthorynchella.

124. S. W. Spoonamores farm land, west of store at Hubble (E 981 corner).
About 10 ft below level of church.
Dev. chert in large quantities below the Black Shale. - On land by in place.
The exposures are west of 2nd church N of 981 road corner, and SW of a house about 1/2 mi W of road.

125. Exposed from near top of bed.
(within 20 feet) and here, are some
colored limestone with plants
fossils.

Here at 125 are some rich fossils
from layers.

126. Highest land carries base of
red brown along road, with full
section of Cuyahoga beneath
as far as locality 28 and
thence eastward as far as
the crest is seen.

127 From Stamford to 127 frequently
fossils of argillaceous rock
resembling Richmond. At 127,
a small outcrop of Clinton, only a
few yards across, beyond which
southward is Richmond a few
hundred yards. No Neal Creek
church. The black slate comes
in and continues as far as the
church. No fossils to be seen by the
church, only lithological re-
semblance.

128. At this locality there is some
more of the rock which lithologi-
cally resembles the Clinton. It changes
exposed over a distance, but no
exposed of any kind near east-
ward for miles a considerable dis-
tance.

129. At this locality there is abundant
Richmond rock along the railroad
and thence eastward along the
road up the hill.

Along the creek, west of 129, is a river
Maysville rock with Pl at pond.
It is exposed, dipping strongly
down creek, northward, and less
strongly eastward. This proba-
bly is only a local dip, but it will
show the strata to rise rapidly
northward. Between these two local
the Amherst should show up
but was not seen. The northward
dip evidently will carry the
Maysville but on creek level in the
200 yds of the bridge.

From locality 129, go south one mile
and take road east to May
wood. Here, this road the rock
- Richmond, dip strongly west.

From May wood south a
rock like that I said before
lithologically like Clinton on
up at angle in road 1/8 mile
south of May wood, the double
Richmond rock is seen.
Several small sink depressions
occur in the Richmond half a
mile south of May wood.

A short distance farther south,
south of the home of Will Roberts,
there is a fault crossing the
road, letting down the Black
shale on the south side. There is a
small trace of chert northward
which may be Devonian chert.

Within a very short distance the old
Crab Orchard road is struck. Follow-
ing this old road eastward, there
is a school house at the point
where the Crab Orchard road turns
off sharply southward. Another
road, a lane, passes between the
gate at the school and follows
down the creek eastward. Nothing
but Richmond seen so far along
this road.

Going eastward down the creek
we reach lower strata, and
just W of the bridge a little
over a mile east of Maywood,
the blue clay blue of the Rich-
mond is exposed with the Plat.
Ponderosa of the upper Amburn
immediately beneath. The Am-
burn top lies at least 5 ft
above the creek east of the
bridge.

Fault runs N 40 E. On N side of this
fault is Richmond rock. On S
side is apparently top of Amburn
with Plat. Ponderosa and with
shale rock above. This is uncer-
tain because since no *Tetradium*
was found.

On second examination I take
it that the Amburn line is over-
laid by shaly Richmond and is
underlaid by shale bed, Plat.
Ponderosa. I say underlaid because
Amburn. No *Tetradium* was seen.
This locality is where road forks,
one mile directly east of May-
wood.

Locality 129, on top of hill,
is the rock which I believe to be
logically like the Clinton. No
fossils but large exposure.
So called Clinton = 77 ft
above R.R. and same dis-
tance above Waverly top
suggesting that it is
not Clinton.

130. Up to this point from Stamping
only Richmond shales and then
bedded & spalling clay rock is
seen. At 130 Leptaena seems
in lower part of Ambheim. Further
west the Plat. ponderosa in the
upper part of the Ambheim comes
in and above this is the Richly
fossiferous blue clay forming
the base of the Richmond. My-
zozans plenty. The rock rises rapidly
by westward, but is overlaid by
base of strata, Richmond. The
eastward dip should be noted.
Further west, the rock must be
nearly horizontal. The Pseudo-
Chonetes shows up along the highest
part of the road. Then Richmond
rises up again westward.
The Ambheim exposure evidently is
restricted to a small area along the
creek at 130.

131 at 131, suddenly the Black shale
comes in. Probably due to faulting.

132. Chert with Ambocoelia umbonata,
evidently from Dev. I. formerly in
situ here. The same chert with
Ambocoelia umbonata & corals
also at the bridge southward. The
same chert is exposed a third time
at the road junction. No 133. These
three localities are at about the
same elevation and the underlying

by Richmond exposed at several
localities evidently belongs to the
Devonian limestone without
faulting, and the Dev. Black
shale which shows up from 131 to
old mine to 51 and thence
westward about as far as 132
belongs where the Devonian lime-
stone is naturally without faulting.
133. Dev. chert with corals.

134. Dev. chert, low & scattered.
A. clayey stuff with sponge flat?
B. dark colored limestone. Plat. ponderosa
shale rock.

A. This sponge I have seen several
times at base of Richmond & Dev.
east & north east of Portland.
B. No Leptaena seen. Assumed
to be Ambheim at top owing to
shale rock below. It appears to
grade downward into a much
thinner mass of dark colored
rock then eastward, where the
Ambheim part appears to be-
come thinner.

27 ft interval between clay
at top with sponge flat and
shale bed below. The upper 5
feet of this interval is clay. Myzozans
The lower 23 = dark colored limestone
at one locality.

135. *Amboceras nuttallii* in Dev.
chert, making argillaceous
rock which may be upper
Mayville. Whether any
Richmond and Lebanon in here
I don't know. Judging from
section 135, only the base of the
Richmond could be here.

136 Apparently 60 ft of Upper Mayville
rock with top of Tate layer at the
base. It may be not the correct in-
terpretation then I don't know
the rock. Apparently no Richmond
here. One chief feature is the large
quantity of argillaceous rock
appearing, and the small quan-
tity of dove-colored limestone
in the Coryville section.

The shale rock apparently rises into
the stream from 136 almost as
far as 233 old number.

233 old number. Creamy,
{ *Strophomena* } Dev. chert & oolite.
{ *Platystrophia* } of? one *Pracypna*
11 ft interval.

4 ft. Siliceous arg. rock with *Pracypna*
fairly common.

25 ft. Siliceous arg. rock with fossils.

21 ft. dove-colored l. with *Platystrophia*
at top and also lower. Clay rock.

A great fault however in Black
shale drop in south side of
this hill.

Land runs N 45 E about 1/2 mile, with the
clayey rock at base of section. The
creek on N side, and the Dev.
l. with fossils on S side of fault.
The chert shale bedded. Dev.
limestone on S side of fault.
The Devonian limestone is
represented only by chert, at top of
hill, lower section.

The Permian represented here
is the Duffin layer, estimated
at 5 ft thick. The Black shale
dips southward here. One
small *Pracypna* runs across creek
but N of the road junction about
100 yds. and some distance
S of fault house on the creek,
grows from road corner.

130. Second top. The *Pracypna* occurs
in the dove-colored limestone
immediately beneath the *Leptaena*
horizon. See section 135 also
which probably represents
about the same thing.

About 35 feet of Richmond over-
lies the soft fossiliferous
Richmond base at this
locality.

One mile S of 233, where road
turns West toward Turnersville.
Coming down the hill at the turn
of the road, the Black shale is
underlain by Devonian chert in
red soil, and then by a shaly
rock resembling the Richmond.
This may be Mayville from
evidence judging from sections
NE of here. I assume it to be
Mayville.

Half a mile west of the last
locality, where a road from
the south crosses in, Plat.
Kendricka occurs in the creek
bed. This evidently is May-
ville. The overlying part of
the section also is assumed
to be Mayville. The thin
bedded stuff starting in
about half way to Turnersville
is assumed to be the Tate
layer. It is important to
note that the Coryville
here does not consist of
glauconitic limestone
but of argillaceous lime-
stone which lithologically
resembles the Richmond.
This might be true some-
times geographically.

Devonian chert is common almost
as far as Turnersville.

137. Creek bottom. Black Shale plenty.
SE of this locality Black shale was
exposed on hill, over Der. limestone.
The way westward dips here, if
not a fault. Over the Der. lime-
stone chert continues to 133, etc.

138. A circum back of house exposed
argill. l. = Coryville probably.
44 ft down is blue l. rubble with
Stroph. mayavillensis. Between
there should occur the Orth. Rhyn-
chona horizon but it was not
seen. Exposures not sufficient
along road to determine whether
the rocks rise strongly since 137
or whether there is a fault here.

139. Below entrance to lane on south is
Stroph. mayavillensis, and near
foot of hill probably is Mt Hope,
and this continues to be exposed
westward as far as Hanging Rock.

140. Up to this point the stone fences
contain Stroph. mayavillensis.
Good exposures seen. Directly
west of house are good exposures
in Stroph. mayavillensis. Between
pikes & creek.
There exposures continue west to
fork of pike.

141. Exposures with Stroph. mayavillensis.

142. Duffin, frutiferous l. but with
Stroph. magnificus scarce.
A very tall exposed Cyclonema,
with weak longitudinal striae
on all rotations except last, and
the last appears out, transverse
striae on. Cyclonema rotundum
transverse. Calymene just
above, at about 955 or 960 U.S.S.

143. Duffin chert + land is high enough
to reach upper Conynville but
no actual exposures of the latter.

144. Duffin chert abundant + Platystrophia
gigas over
a little chert + Strophomena
bandensis. Platystrophia species
uncertain. Probably upper
Conynville.

145. Black shale.

146. N. of Millersville. Duffin layer
over gray Devonian limestone.
as seen from bridge.

147. The same flat exposure as at 134, with
lying the same large dome-shaped
section, overlying the same
shale section. The dome shows
limestone. Plat. ponderosa +
Strophomena.

148. Duffin exposure at about 995
U.S.S. with Black shale
northward.

149. S.W. of 149 is Duffin layer over
gray Devonian limestone.

Here is Duffin layer
gray l. with corals.
3 ft dome-shaped l.
8 ft sandy weathered stuff
full of Plat. ponderosa.
and some Petrolites
but not a single Strophomena brown.
only a few are found.

150. S. of Junction City.
Devonian limestone see
old number 220.
Internal about 10 ft or less.
5 ft Argill. block. No fossils.
3 ft. Strophomena common at top.
Large Strophomena at base.
Collected. Sand at S.E. of
Junction.
N. Branch of creek. low.

151 Duffin layer over
gray limestone - Devonian.
No Ordovician

152. Duffin l. at top of hill. See old No. 2173
Internal.
Dome-shaped l. = upper Conynville. Plat.
Duffin.
Plat. ponderosa common in creek.

153. Near road level is *Stroph. may-*
villensis, ^{same} nearer house level is
 more fossiliferous rock but no
Certh. bligny clausa seen although
 this should have occurred near
 top of fossiliferous horizon. A
 large *Platystrophia* like *hyazum*
 shelled up near top. A similar
 species appears to have occurred
 at creek level at 152.

154. *Eschschopora hilli*.
Phyllorhynchus.

22 ft unknown. < R

7 1/2 ft { *Stroph. mayvillensis* same as at 142 but not
Certh. bligny clausa only *mayvillensis*
 58 ft with *Stroph. mayvillensis*
 5 1/2 ft interval }
 bridge level. } unknown.
 15 ft
 creek level.

along the same on new map
 a long distance southward
 formerly on top of hill goes
 into but may have been
 No black shale exposed
 the southward dip
 60 ft interval with *Certh. bligny*
argill. l. with chert nodules.

R

155. Shaly Ordovician, horizon
 unknown. - *Fate* layer since
 going down till the *Stroph.*
mayvillensis is well represented
 in field stone fence.
 Duffin layer well exposed
 south of junction. strike of fault
 apparently nearly E + W but
 this is uncertain.

much chert
 156. Harpersburg chert fragments over
 Brooks limestone.

157 Black shale. First exposure go-
 ing down creek.

158. Dev. l. with *Antrevelia*
umbonata etc. First exposure going
 downstream. Pebble base.

159. Clinton. First exposure

160

Clinton force

51 ft. hard. argill. rock

No fossils except things that look like worm burrows. That is made and made through rock.

Internal large enough to account for all the bedding necessary.

10 ft thin bedded argill. rock. place may be lower Richmond. No fossils

162 5 1/2 ft massive cherty rock. Black shale

8 ft bedded Der. limestone.

7 1/2 ft shaly stuff 6 ft sandy rock

2 ft. dove colored l.

2 ft. shaly stuff with *Prasopora* common

8 ft shaly stuff

10 ft. Black. *Prasopora* & *Leptæna*.*Leptæna* & *Der. dentata*.

5 ft internal.

Chert rock at top of *Prasopora* contains *Phillipsia*.The sandy rock below the Der. limestone may be *Der. dentata* also but this is uncertain. At any rate, it does not appear to be the same as the *Der. dentata* Richmond.161. *Leptæna* above *Prasopora* bed 2 ft.

163 Dove colored limestone in creek bed from 161 to 163,

164. Der. chert.

35 ft. Internal. *Prasopora* in lower part. in *Der. dentata* l.*Leptæna* common.27 ft. Internal. chiefly dove colored *Leptæna* at top. *Prasopora* at top.

13 ft. dove colored l.

27 ft. creek bed

Section NE of spring. Up creek from the Hall school house about 1/2 mile.

The locality is on Scrut Grass creek, about halfway between Mill branch and the road to Adair which starts off farther down the creek.

165. Rollings is about 1/2 mile up North Fork from mouth of Scrut Grass. Back: S of stone.

Der. dentata.

30 ft internal.

Leptæna common.

33 ft. dove colored l.

50 ft. internal argill. rock. creek bed.

Up the Fork, eastward, the lower part of the preceding section is well exposed. It is the lower *Crinoid* - shaly bed. Notice that under the *Crinoid* bed is shaly *Crinoid*.

A. On the corner north west of
Coryville is a large, irregular
mass of black shale, which is
evidently a fragment of the
Devonian. It is a fragment of the
Devonian.

B. A short distance beyond forks
of the 1 1/4 mi west of 1st mile
in the southern branch, turned
conspicuous station.

Devonian limestone,
10 ft dark red to white. Fossils
in a fragment.

56 ft not exposed here.
10 ft argill. to east of Platteville
Devonian = upper Devonian?

At least it is above the Carboniferous
horizon and the
bridge 1 mi. W of Platteville,
Crest level here!

The Devonian limestone has
been present at all exposures
along the western border of the
Andersonian from Maryland to
the present west of Platteville.

C. Where road turns off 2 mi. 1 1/4 mi
W of Platteville.

Dev. limestone,
6 ft dark red to
shale layers. See section 224
old road for.

About half a mile beyond the
county boundary, where a road
turns off south, black shale is
exposed. A very short distance of
that road up to this point
(since C) evidently is under
laid by the Devonian limestone
at one.

At the RR cut directly south of
Maryland the Dev. chert overlies
the residual above colored brown
stones at the top of the Coryville
section.

0	.90	1.55	5.40
2	.90	1.55	5.40
7	1.05	1.70	5.55
12	1.20	1.85	5.70
17	1.45	2.10	5.95
22	1.80	2.45	6.30
27	1.82	2.47	6.32
32	1.90	2.55	6.40
37	2.10	2.75	6.60
42	2.20	2.85	6.70
47	2.25	2.90	6.75
52	2.30	2.95	6.80
57	2.35	3.00	6.85
7<60		3.22	7.07
64	2.57	3.30	7.15
69	2.65	3.47	7.32
74	2.82	3.65	7.50
79	3.00	3.95	7.80
84	3.30	3.60	7.45
89	2.95	3.45	7.30
94	2.80	3.45	7.30
99	2.80	2.77	6.62
104	2.12	2.25	6.10
109	1.60	2.10	5.95
114	1.45	1.85	5.70
119	1.20	1.55	5.40
124	.90	1.25	5.10
4<128	.60	1.15	5.00
133	.50	.75	4.60
138	.10	.55	4.40
143	dry	.55	4.40
144 1/2	dry		

7.8
3.95
3.85

.18	.72	.54
.18	.72	.54
.21	.84	.63
.24	.96	.72
.29	1.16	.87
.36	1.44	1.08
.36	1.44	1.08
.38	1.52	1.14
.42	1.68	1.26
.44	1.76	1.32
.45	1.80	1.35
.46	1.84	1.38
.47	1.88	1.41
.51	2.04	1.53
.53	2.12	1.59
.56	2.24	1.68
.60	2.40	1.80
.66	2.64	1.98
.59	2.36	1.77
.56	2.24	1.68
.56	2.24	1.68
.43	1.72	1.29
.32	1.28	.96
.29	1.16	.87
.24	.96	.72
.18	.72	.54
.12	.48	.36
.10	.40	.30
.02	.08	.06
dry	dry	dry
dry	dry	dry
1/5	1/5	3/5
.2	.8	.6

Mr. Curdsville at 875 as well as
can be made out from
residual material and from
our lines.

Grand Switch

At creek 1 mi N of Grand Switch is
thin bedded rock layers, fossiliferous.
Probably the MS type bed, since the
sandstone is supposed to be massive,
but it may be the 50 ft. one of the
sandstone. No diagnostic fossils
noticed.

Strophomena and other fossils occur between
here and halfway from creek to Grand
Switch.

179 old number. Hardly half a mile
N of Grand Switch at the forks of
the road, the stream bed exposes clay
rock, splitting into small fragments,
with thin limestones at
13 feet above this level is the horizon
fully of Praxipora and nodular
masses, same as S of Rattlesnake
at Riley.

Devonian limestone occurs a short dis-
tance above the level, both MS & S. It is
generally not more than 10 or 15 ft
thick. Black shale above.

About 1 mi S of Grand Switch where road
crosses creek, going west, another road S,
Dev. l. only 1 ft. or less exposed.
25 ft interval.

Large + Praxipora + nodules common.

Southward down stream, the dove
colored limestone comes in at least
16 ft below the Praxipora layer. Possi-
bly more.

At North Fork cutting lower than
middle Cornsiller shale bed below
New house, dove colored l.

Black shale

5 1/2 ft Dev. l.

66 ft interval

splitting arg. rock
shale. } 33 ft

Nodular rock
Praxipora c.

Partly exposed
in bed of creek
fossils few } 33 ft

argill. rock
with small branches
+ corals.

E. Near same house Ed. Wells 1 mi
along road from North Fork, up
branch rising toward SE of 185?

6 ft Devonian l.
splitting arg. rock.

33 ft (shale) layers.
nodules + Praxipora c.

18 ft or more

Top of base of fossil section 6 ft thick
dove colored l.

E

Sprague stream from last locality
 looks promising. Comes in in
 upper member as further east.
 After American form of *Leptaena*
 with 4 ribs & also in gold. The
 formations appear to come up
 stream.

F. Crossing Black shale divide
 southward into the west valley.
 Halfway between Maria Rowlings
 and Alfred Isaacs.

Devonian L.

3.3 ft shaly rock.

2 ft *P. transversa* & *Leptaena*.

4 ft shale bed, heavily exposed.

4 ft not exposed.

6 ft by means abundant *Leptaena*?

Black *Leptaena* c.

6 ft

Leptaena.

trace of *Leptaena* zone not looked
 for.

G. Mormon Church going S into
 Jones Fork.

4 ft Dev. L. + corals + *Spinea*
 large with large *Leptaena* & *Leptaena*
 31 ft. argill. rock upper half
 massive lower half shaly.

H. South of home of Carl Rey, where
 road across divide of Jones
 Fork road.

Black shale.

4 ft Dev. L.

3.2 ft shaly arg. rock, some *Leptaena* c.

14 ft. Not well exposed here.

6 ft with *Leptaena* & *Leptaena* c.

Leptaena *dentata*, *Leptaena* c.

Leptaena rather rare, in lower Plat.

Leptaena *Leptaena*.

At Home of J. T. Hogan, 1 mi E of
 in north of Jones Fork. On Jones
 Fork it is all. The stream enters
 into S. Fork at 2 miles E of
 Bradfordsville. From summit of
 Jones Fork to the mouth of Walleray
 creek is 3/4 mile east.

See next page

5 1/2 ft Dev. L.

Leptaena c. *Leptaena* c. within 6 in
 of top of *Leptaena* section here.

81 ft interval.

Leptaena c.

Leptaena *dentata* *Leptaena* c.

This is one of the best sections for
Leptaena - *Leptaena* interval,
 an account of its exposures.

Same place. N of J.T. Wagon

- 5 1/2 ft. Devonian limestone
col. abundant within 6 in of top of bed.
66 ft interval chiefly shaly beds.
P. prospira & prospira
10 ft interval shaly with fossiliferous base.
5 1/2 ft. fossils plenty. P. prospira & prospira
1 1/2 ft. Leptaena common, 1 Rhy. dentata
12 1/2 ft. dark bedded with Leptaena at top and P. prospira in gray
limestone in middle of bed. Leptaena
beds near base, (+ Bellerophon in lower half)
8 ft. dark shaly bed.
J. W. Isaacs

J. W. Isaacs, Pleasant View farm
South of Raleigh on Wallerway Creek
shaly bed. = Wallerway Cr.

- R 1 ft 10 in. interval P. prospira.
1 ft. P. prospira collected near common
2 1/2 ft. not exposed well. P. prospira & prospira
6 1/2 ft. shaly fossiliferous P. prospira & prospira
5 1/2 ft. Leptaena rare except at base, where it
is only moderate in numbers.
1 ft. clay rich with fossils few
clay rich.
1 ft. Leptaena & Leptaena large brachiopods
P. prospira & prospira & prospira & prospira
1 ft. sh. limestone with large brachiopods
1 ft. sh. limestone fossils few.
1 ft. sh. limestone & P. prospira & prospira

The Leptaena bed is exposed in the
creek bed from here to the Pa-
sperat road bed the exposures
are well shown also in the
creek bed. A magnificent exposure
of the shaly bed is seen up stream
B. Leptaena shaly.

- 4 ft. Devonian l. the Leptaena in center
6 ft interval.
S 1/2 ft. Leptaena
64 ft shaly bed.
R P. prospira & prospira long double
and P. prospira & prospira double
monte.

Continuation of P. prospira shaly bed

- Devonian limestone bed.
8 1/2 ft. interval.
S 1 ft. Col. abundant & prospira
8 1/2 ft. interval.
Shaly bed.
1 ft. Leptaena & Leptaena P. prospira & prospira
6 in. Leptaena & Leptaena & Leptaena
6 in. Leptaena & Leptaena & Leptaena
1 ft. Leptaena & Leptaena

1/2 mile farther North
Dev. limestone absent
18 ft interval
S 1/2 ft. Leptaena in creek
Note entrance of Devonian
here Richmond is the bed

~~5.0 ft dense colored L, top not seen.
3.0 ft shale rock
crack level.~~

S of Wm. Van Porden, where Lane
strikes L. 5 F. 1/2, 2 miles E of mouth.

Black shale.
2½ ft. Druffin Dargie.
5½ Dark grey l. chals. ~~plenty~~ moderate
20 ft. Shale bed.

Verdusca *parviflora* not common 98 ft
2 ft sandy clay.

7 1/2 ft by various C. & Plat. & underca.

1:47 Sept 18

3' 14' Fossiliferous.

5/4 Wt will express $< 79\frac{1}{2}\%$

Top of dove colored limestone,
25 ft dove colored l. L54 1/2

52 1/2' shale bed - Coryville +
possibly part of Tule bed cut } 0
base of part is red thin + shaly } -8
creek bed.

= 126 ft from back to D. station.

$= 29\frac{1}{2}$ ft from ~~East~~ ~~Adm.~~ to ~~D. cross~~

126

7.54 ?

$920 \div 115 \approx 8$. probably.

Impress the broad veranda on gate
with confidence.

172, Piedmont Church $1\frac{1}{4}$ mi E of Last.

Der. chart. exalt. + Prunella

15/25.

Leptocarpus

77 ft. gate in embankment } 104 ft.
23 ft. not exposed }

$5\frac{1}{2}$ ft. *Bysanogobius*, *Pleurogrammus*, *Lepidosteus*, *Heterostichus*,
Serrula caesi. Plac. *Paralichthys*.

15/7. Some fruits more orangey red, but
not as many as the others.

173

The lower fossiliferous layers
shown up a part of a quarry
of a mile south at John-
son's chapel.

174. The same rich fossiliferous
horizons can be traced eastward
almost to Harrolyte. At 174 only
the top of this horizon is seen, cov-
ered by shaly beds.

175. Lepidodendron and Leptacanthus
Fossiliferous
Black shale

6 ft. Derwentian limestone

7 1/2 ft. not exposed

4 ft light green soft clay,
in nodules.

6 ft. spalling clay.

3 ft. softer clay stuff, fossils few.
Lepidodendron, one but distinct.

3 1/2 ft. fossiliferous layers.

Top of dove-colored l.

40 ft. dove-colored l.

22 ft. not exposed, red l. (probably
shale) over bed.

176. Asa M. Simpson's store.

Black shale.

3 1/2 ft. Duffin clay.

7 ft. 6 in. Der. limestone.

Section at Duffin cut
as the lower part of the Derwentian

ord. but probably in the same

7 ft 6 in. massive rock looks like

13 ft 6 in. Spalling clay rock

6 in. Derwentian common.

Lepidodendron + Rhynchonella.

2 ft. interval

19 ft. Top of heavy l. layer with large
branching trigyrans. In part by Jones
creek level.

177. Base of Der. reaches creek level,
Ordovician top same as at 176.

178. Black Shale base reaches creek level.

South on road to Smith Fork up
road leaving a short distance
up creek from 174. Here the Black
Shale is exactly 50 feet thick,
Linnæa base full of nodules
1-3 inches in length.

Conifers Gaborvadi

Road along creek leads
into Smith Fork, empties 1/2 mi E of Duffin
= Powers, 1878.

Black shale

Derwentian l.

20 1/2 ft interval

2 ft. Leptodendron, Holopora, trigyrans
Probably, Amplexus but not Leptodendron
found.

Interval not exposed

Dove-colored l.

Shale bed.

See next page.

About 1/2 mi E of Plover is a
clay rock with Plat. ponderosa
and P. aspera. This rock
dips rapidly up stream - east-
ward. The rock is not well
exposed. Horizon unknown.
I recall I have seen this could be
the rock at the top of the
rock which Plover is said to
be found in the Hills hand section.

NE of town of S. T. Hancock, 2 mi,
east of Plover, Ky. & 1 1/2 mi W
of Ellisburg.

I have not exposed. Mr. Timm
38 1/2 ft. Black shale, cut an. ...
50 ft. Interval and exposed. At
very base on top of a fragment
which may belong to American.
No definite fossils.
13 ft. dark colored. Plat. ponderosa
Goph. ...
4 ft. in active arg. ...
18 ft. shale ...
22 ft. Interval.

about 5 ft. interval.
Don't know if this is but
not exposed.

Judging from the presence of
certain clay shale bed exposed
here.

Further down the stream halfway
between Plover & Ellisburg. The section
being rock with P. aspera & P. ponderosa.

NW of school at Ellisburg.

R 6 in. P. aspera a large & abundant
5 ft. dark colored l.
5 ft. shale bed.
11 ft. shale above, dark colored below, part
15 ft. dark colored l.
58 ft. interval.

creek level
5 < 2 ft. light colored blue, soft clay.
2 ft. same as in dark shale.
Between in Plover section.
evidently some mineral deposited as
among in soft clay and which
7 ft. Plat. ponderosa excellent but not
2 ft. Plat. ponderosa
R P. aspera c.c.r.

The section has the same out
to nothing.

Black shale
2 1/2 ft. Duffin Oyster.
2 1/2 ft. Cherry Devonian limestone, possibly the clay.
1 ft. interval exposed.
S < light blue soft clay with red dunes
see sections in Little South valley.
This places all of these sections
in the Mayville practically.

Some slip somewhere.

This section should be used
for Columbus river.

~~1 1/2 mi E of Ellensburg, S. of turning off.~~
~~one mile S of Ellensburg~~
~~2 1/2 ft Duffin layer~~
~~3 1/2 ft cherty, Der.~~
~~30 ft covered~~
~~13 1/2 ft dove colored l.~~
~~34 1/2 ft~~
~~creek level~~

1 1/2 mi E of Ellensburg, R.
 1/8 mi S of Jones Ellis.

Black shale.
 1 1/2 ft Duffin layer.
 3 1/2 ft cherty Der.
 7 1/2 ft shale bed.
 2 ft dove colored.
 7 ft shale bed, chiefly covered
 by a fence.
 shale bed below bridge

S of Jackson. Steele's Ranch road
 to Liberty = Cuyler's P.O.
 3 1/2 mi W of Powers, nodules
 40 ft Black shale exact succession
 Der. in chert.
 35 ft. Not exposed 15 ft more or less
 1 1/2 ft dove colored l. solid.
 13 ft yellowish, chiefly shale - covered
 creek bed under road.
 3 ft argill. with pebbles
 Septena horizon.
 1 1/2 ft argill. rock.

A

S \swarrow 1 ft ss.
 96 1/2 ft typical Roubidoux but no grades.
 30 ft harder arg. in that run.
 33 ft softer lower Roubidoux shale
 33 ft Limestone.
 R \swarrow 25 ft red cherty soil. Hardening?
 33 ft chert chiefly some banded
 5 1/2 ft chert chert
 11 ft sandstone.
 16 1/2 ft l. + sandstone interbedded.
 2 1/2 ft cherty l.
 3 ft sandstone.
 2 ft limestone cherty.
 2 ft sandstone.
 2 ft. limestone cherty.
 3 ft sandstone.
 1 1/2 ft ss.
 1 ft shale Roubidoux

(Not shown
 across the

S \swarrow
 1 1/2 mi

12 ft
 A. dove colored l.
 soft light blue clay + rock.
 6 in. l. Praxipora a C.
 7 1/2 ft almost light arg. rock
 Praxipora rare
 12 ft solid of dove colored l. =
 conspicuous layer of other
 section.
 > long interval with not very many
 probably black bed
 Large shale section
 9 ft Praxipora like form at top
 of improved upper section with
 gigan spire 2 in long
 under road

Don Steele's gap branch as far as
Jackson, only the upper 1/2 mi.
must be exposed to see the
nodules first is seen.

At Smith's bluff the underlying
large shale bed comes down
to creek level.

About 1 mile eastward, the
underlying dove colored l. comes
down to creek level.

Anticline at Rockford
13 mi. S. of Church.

Saw mill 300 yds W. of main road
at saw mill 1 1/2 mi W. of
Powers and 1 mi E. of Rush
Branch. The dove colored l. comes down to
about 6 feet above creek.

Rush Branch is 1 mi W. of
Marion-Carey Cr. line.

7 mi. from Rush Branch to
Bradfordville.

Arrived Turn of at D. C. H.
Bateman's house half a mile
west of Bradfordville on the
road to Marion.

Columnaria racina.



Section 1/2 mi W. of Rush
Branch S. to Marion.



Platystrophia

15 1/2 ft. below D. C. H. line it
is possible to find a large l. Do
not know how far it has
dropped - along the road.

A rapid southward rise,
shale bed, rising to
large exposure of shale bed.
nodules, irregular.

3 ft fossil. layer, a few fragments
3 ft shale bed

shale bed
3 ft fossil. large rubble l. mat.
1 ft Leptæna l.

2 ft argill. with small c.c.l.
3 ft argill. with fossils few.

Top of ridge North end of Branch
 331 chert beds, just W of Pigeon Church
 Road off Branch Branch, leaves
 Branch Branch at one, goes NE up creek.
 Rocks rise along creek all the way
 Septaria exposed about half way to top of
 ridge. Chert beds occupy highest
 33 feet of section. Heavy chert of Steele's
 Hunt section. Very steep section here.
 179. On road from Junction City to
 Locality 68 on the Danville Stam-
 ford pike. = Devon chert at top of
 hills.

180. Dev. chert on argill. rock with
 Plat. ponderosa. Probably
 upper Marysville.

Loc. 81.

On this upper level there are large
 limestone blocks here or widely scattered
 as to suggest that much of the material
 may be ss.

Turn gate (Partly consolidated ss.
 58 1/2 ft. interval, with some limestone
 85 1/2 ft total, down to T

11 1/2 ft reddish l. at various intervals.
 Some of the layers 5 in thick.
 Plectambonites c.c.
 Dalmanella multisetosa rare
 5 1/2 ft. Fine grained arg. hard rock 1/2 mil.
 interbedded with fossiliferous layers.
 Rafinesquina c. Trimacrus
 Plectambonites cc. Calymene
 bygonia, c. Dalmanella
 5 1/2 ft. Thin "sandy" and thin red fossil-
 iferous. Plectambonites c.c.
 Trimacrus. Zygospira muricata.
 Dal. multisetosa, r.
 Tentaculites, or small sharp, and fine
 vertical stipes. Rafinesquina
 5 1/2 ft. Percentage of "sandy" layers larger.
 Dal. multisetosa rather rare. bygonia.
 Trimacrus. Rafinesquina.
 2 ft red l. layers near
 3 1/2 ft. "sandy" layers
 Plectambonites
 Dal. multisetosa common.
 5 1/2 ft. Some red l. but "sandy" layers
 predominate. Rafinesquina
 Zygospira c. Dal. multisetosa
 not common.

- 4 ft chiefly sandy strata
 1 1/2 ft reddish limestone,
 Dal. multica small, and
 some incl. verticals 3/4 in. in width.
 = R Rafinesquina. Zygospira.
 L. sp. a. quadra. Fimbriatella
 Bryozoa. Orthoceras.
 Bryozoa. No Plectambonites
 seen.
 5 1/2 ft Several thick red. p. layers in
 chiefly sandy layers,
 greenish spots rather common.
 Dal. multica common
 near top. Rafinesquina
 Calymene No Plectambonites
 seen.
 3 1/2 ft chiefly sandy layers
 Rafinesquina. L. a. c. also
 numerous small flat spec-
 imens. Cyclonema. spire not
 1 ft. Diapora micula
 Bryozoa. Bryozoa.
 Dalmanella very fine strata = emaculata
 some in middle & lower part.
 5 1/2 ft! chiefly sandy strata.
 Fossils few. Rafinesquina.
 Calymene. Zygospira.
 5 1/2 ft chiefly sandy layers. Fossils few.
 Rafinesquina. Lower 2 ft = red
 in part.
 5 1/2 ft chiefly sandy layers. Fossils few.
 Zygospira. Isotelus pygmaeus
 S Rafinesquina. 1

- 5 1/2 ft. Sandy layers. fossils few.
 Rafinesquina. Calymene.
 1 1/2 red. p. at base.
 5 1/2 ft. Sandy layers. Fossils few.
 One Dalmanella.
 Rafinesquina. No Plectambon-
 ites.
 3 ft. Sandy str. Fossils few.
 Rafinesquina.
 T All lower intervals too small, strong
 1 1/2 ft No exposures. west dip
 Yimutana. Crinoid stems
 Rafinesquina. Possibly top of
 Lythiana.
 20 ft No exposures.
 7 1/2 ft Thin sandy strata.
 11 ft massive gray and blue sand
 Blue rocks like Pennsylvanian with
 Helvetella abundant more common.

Loc 181, G. and sandstone, some in
 will. exact base not known.

182,

Excellent cases of pressure
boulders with top and bottom
remaining parallel and un-
broken.

= Lexington on E.

11 1/2 ft. mostly fossiliferous. Dolomitic rare.
Rhynchotrema several, Prægonia few.

2 3/4 ft. more fossiliferous sandy &

11 1/2 ft. sand limestone, rather few fossils
cracks. like Barrow a little

183. Top of hill + south slope red
soil with Devonian corals
Heterospira & quite a num-
ber of Rhynchotrema + Heterella
fossils in mass of Lexington. The
Lexington is at a short dis-
tance below.

184. Barter rich with large masses
of zinc.

A. J. Haydon farm.

Barter runs a little north of E.
The south wall is slightly
sided vertically. The
north climbing bank is
Lexington. Rhynchotrema
eccentric, Prægonia, etc.
+ 2 Rhynchotrema.

The south wall appears most
like the Barter but
more sand & calcareous.

Possibly only a slip of 10 to
30 feet.

185 - NW of Smith City,
Duffin cut.

6 3/4 ft Duffin layers
5 ft Cherty beds.

7 in.

2 1/2 ft. } grey arg. limestone with
2 ft 3 in. } comparatively little chert.
2 ft 3 in. }

? Devonian. Plat. p. n. d. v. s. c.
Cornwall. May be middle

186 - Massive Barrow ss. overlaying
much larger section of thin bedded
shale, Barrow ss. Fossils absent. Rhynchotrema
Prægonia in very thin calcareous
layers.

187. Eden red. + "sandy" layers
Dol. multicaula, Plectambonites.
Bygonia clava, etc.

188 From last locality the Eden extends
half way from 187 to 188. At 188,
100 yds south of the culvert over the
creek, the Barter runs from 184 down
up again. It also shows up west
of the road at 184.

The Eden runs slightly NW of E. It
does not follow the creek. Possibly
the Cyathophylloids dropped out
the south side a very short distance.
The Eden runs straight on
in the valley of the creek above.

189, Lower, sandy shale. Eden. Probably
dropped a little. No *Cynthis* seen
unless it is on south side of
vein, as a country rock, in ditch.
Doubtful if seen at all.

190. Gward ss. chiefly shale.

191. *Strophomena mayavilleensis* - Fam-
mount.

192. Devonian chert. Any southward
dip of upper part of Duffin layer.

193. At home, base of *Liniella*, with
Black shale down the road
northward + southward.

194 South of Parksville, top of land.

Lithology cylindrical form
Lithology in polygonal form.
20 ft of St. Louis. basal part with
Spizger + *Productus* abundant.
11 ft. Spizger. full of fossils

21315 USGS,

25 ft brownish with chert, *Productus* rare.

2 1/2 massive *Productus*.

16 1/2 covered

10 1/2 ft brownish *Productus* fully *Productus*

8 1/2 ft massive *Productus* with *Gardes* small.

22 ft *Productus* with *Gardes* brownish.

107 1/2 *Productus* no chert

195

30 ft below level of Spizger. *Productus*
Productus dubia *Productus* is found. in
thin bedded cherty limestone

This cherty limestone has its base
35 ft below the Spizger. imme-
diately above a very massive
Productus section. North of section

194 this thickness was 25 feet but
irregular was taken of strong
southward dip where one must imagine

5 ft thin cherty l. mentioned above.

Massive *Productus* above.

13 ft. *Productus* exposed below

5 ft limestone. Very cherty below.

40 ft massive *Productus*

38 1/2 ft less massive *Productus*

90 ft softer *Productus*.

196 creek at base of section.
No exposure for long distance.

197 *Liniella* clay. Top not seen.

198. *Liniella* clay to south of creek.
Black shale at first exposure
down north. *Productus* *Productus* *Productus*
of Parksville house must be
about at level of top of Black Shale

199 *Liniella* clay at base of *Productus* area

R > Top of ridge.

32 ft chert from *Productus* layer. *Productus* plenty.

38 1/2 ft exposures, *Productus* like *Productus*.

77 ft *Productus*, *Gardes* in upper half.

47 ft softer *Productus*

44 ft *Productus* *Productus*?


Liniella clay at base of *Productus*


Catholic church,
30 ft interval.
Little or no cylindrical
20 ft with oolitic chert,

R>

200. Nothing certain except Harrods-
burg chert since 199. At this
last locality - 200 - Phillips-
miller and other Harrodsburg fossils
are found.

201. Atherium bed, 5 ft, full of fossils.
grey, sandy appearing.
33 ft up is St Louis with *Syrin-*
gyna & *Archaeoidaris* &
Spirifer.
17 ft up with St Louis l. blocks
loose.
2 ft. Very abundant quartz
pebbles 1-1 1/2 in. diameter.
Top of section.

202. Massive l. like Spargenall
about, apparently, judging
from blocks along the road,
with Atherium like material di-
rectly beneath.  crinoid.
At road junction.

203. Limestone, Spargen? 9 in. thick
underlain by at least one layer
with fossils  crinoid

204,

Top of Harrodsburg. Large conplanate
blocks ~~remains~~
41 ft interval, with surface covered
by congl. blocks.
6 ft sand, yellowish brown +
some white.
16 1/2 ft not exposed.

One loose St Louis block at top.

1435 USGS, according to former,
15 ft interval. St Louis chert
and some shaly limestone.
Top of massive l. such as was
the ~~little~~ clayey ma-
terial.

This massive l. is part of
Atherium bed and not the
Spargen portion.

205. The rock apparently rises south-
ward. The Atherium l. exposed
before reaching the house, and
then nothing but Harrodsburg
chert is seen.

Further south the road gets down
to the good farming land.

206 Good farming landstone at junc-
tion with road across Harrodsburg.

207 Top of Black Slate is 3 feet
above creek crossing.

208 Black slate at 1600 ft USGS.

209. Black Shale top at about 1100
H.S.P.S. judging from com-
mon fossils

210. Black Shale top somewhere
over 1070. Probably close to this
number.

211. Black Shale top somewhere over
1100, probably very close, since
it at least reaches this level, and
is found where jacks crosses creek
westward, south of R.R.

212. Eden at Smith's place of hill.
Dalmatella abundant.

213. Eden. Dalmatella, Trilobites
+ Trilobites

214. Eden Dalmatella, Trilobites
claus

215. Rock resembling Perryville. What
to Perryville.

as Cynthia? 15 ft
faintly crasse glauca bed

4 ft Dinorthis ulrichi. C.
Internal mass.

4 ft. Perryville bed. No fossils.
Top of Perryville bed with
Plynechthema + Helicotoma
faintly crasse glauca. Part of the
interior fine grained

216.

base of Perryville bed.
finely, with Petrarchia & other fossils.
R 12 ft fine grained Trilobites and Helicotoma.
215 ft. Petrarchia with other fossils. grey,
medium grained. l. Several
Plynechthema.

R = Petrarchia, Helicotoma, Plynechthema &
And Helicotoma & Helicotoma.
Helicotoma & Helicotoma & Helicotoma.

217

5 1/2 ft massive l. full of Trilobites.
Dalmatella not undisturbed.
6 1/2 ft Shale, sandy, Trilobites.
8 1/2 ft massive rock.
1 1/2 ft Dinorthis C.C.

1 1/2 in. Strophomena & Strophomena, Plynechthema,
Trilobites.

6 in Plynechthema & Strophomena.
6 in Trilobites.

9 in Plynechthema, Helicotoma, Helicotoma.
4 in Strophomena, Strophomena, Strophomena.

3 1/2 ft Perryville bed.
creek bed.

48. Dinorthis ulrichi.
Just over not one seen.

5 ft Perryville, trace not seen.
creek.

219 Strophomena & Strophomena.
220 Strophomena, Strophomena, Strophomena.
Strophomena.

Strophomena, Strophomena, Strophomena.
Strophomena.

221. *Almon* Sp. S. of
Perenopora abundant
 regarded as *Cyathophylloids*
 222. Top of Black shale about
 1100 W.S.G.S. judging from
 contour levels.

80. Perryville bed exposed, overlaid
 by rock containing *H. frankfortensis*. This contact is proof
 at 217, that Perryville bed belongs
 to the Lexington limestone.
 223. Harrodsburg chert to top of hill.

224. From 223 to 224 only Harrodsburg
 is shown at top of hill.
 from about 1300 up. at 224
 there is a little patch of Athens
 limestone, 4 feet thick, with *Pentamerites* large form.

225. St. Louis ls. in place, at very
 crest of hill = 3 ft.
 Rock contains *Cynophylloids* fossils.

226. The Athens bed is well exposed
 along the road, near the road
 junction. Near 1270.
 { 11 1/2 ft Athens bed, chiefly
 massive limestone, but with
 large intervals not exposed, which
 may be clayey.
 { 9 1/2 ft Athens bed, chiefly clay, some l.
 { 11 ft 13' or 14' large, massive
 limestone.
 { 9 ft clay
 6 ft Harrodsburg l.
 6 ft chert & nodules, some l.

15 ft Harrodsburg lower half
 weathered sandy.

2 ft Chert. massive.
 16 ft Harrodsburg, more massive.
 20 ft *Hyndulifer* in Harrodsburg.
 42 ft Harrodsburg
 16 ft.

Level on road in front of house.

Harrodsburg l. here has good
 fossils for collecting, not
 silicified.

Top of Black shale is about 5 ft
 below R.R. level.

227. Base of *Limnetha* layer 1020
 accurate W.S.G.S.

228 - Fine grained St. Louis l.
 15 ft sort of sandy l. weathering
 into soft clay. May be St. Louis.
 1250 } 15 ft Athens limestone
 W.S.G.S. Harrodsburg l.

Rocky little *Cynophylloids* fossils
 are abundant.

76-77.
 to den thickness up to 4' or 5'
 limestone at top, or above clay
 sandy layers 4 1/2 ft. Section
 below.

Top of 4' den not seen.
 Section probably.

38 1/2 ft with *D. almonensis* at top
 19 ft chiefly sandy shale
 22 ft to den with some l. chiefly clay.

and a fine 6 in. limestone bed.
 5-12 ft. Eden, chiefly clay in the lower part.
 { 3-4 ft. Limestone, probably Cyathocrinus
 8 1/2 ft. Masses of full of bryozoans.
 2 ft. + 1/2 ft. exposed.
 { 9 ft. { Smith's river or in mass.
 { Fine grained limestone.
 { 7 1/2 ft. Limestone. Probably partially
 4 ft. Perryville bed.
 49 1/2 ft. Partially Middle town part of Perryville
 creek.

As you walk the rock rises rapidly
 so that the Perryville is not seen
 even at the highest point of the
 hill North of the road as far
 as the eye can see.

There is a remarkable boulder
 of are in the Cyathocrinus bed
 on the other side, west of
 the creek crossing.

56 — Bridge level 831 USGS.
 Base of Cynthiana = 842 ft.

229. — J. T. Sandridge

Barites vein, lead a very little
 zone at Smith's end. Runs N +
 S with junctionally.

Then lower Lexington. The
 rock is the same con-
 tained layers in it as east
 of 76-77, on the way to the
 creek crossing. Then con-
 tained layers from 84 ft. to
 4 ft. in the west side of
 of vein 900-950 USGS.

230. Sand and sandstone.

231. Harrodsburg.

{ Trinaclena Transverse like
 4 ft. { red l. with Dolomite multisepta.
 { clay shale
 12 ft. { fine grained arg. l. + much more
 6 1/2 ft. Limestone + clay shale.
 { 12 ft. Limestone, rather shaly. Full of Pecten
 operat. other bryozoans. Cyathocrinus upper
 7 ft. argillaceous rock, with scattered nodu-
 lar masses of size of fist. Zygospira
 Lingula. Scattered thin bedded layers
 { 2 ft. Stroph. vicia. Rhynchotrema
 1 ft. Large Stroph. vicia.
 2 ft. Same grain and l.
 Harrodsburg. Harrodsburg.
 Ditto small, red, fine
 Perryville bed.

The Perryville bed is found, dipping
 for a long distance NW from the
 cut.

232. Along south road, along the B.R.
 the Cyathocrinus limestone are
 underlain by the Cyathocrinus and sand-
 stone argillaceous and limestone.

233. South of the road crossing, the
 stratum with Stroph. vicia
 is exposed. Overlain by a sandstone
 lower Cyathocrinus. It is full with
 rather dense fossil. Large Zygospira
 no. 760-761.

234. From 233 the rock rises
 with the railroad. At first
 the whole area is *Cynthis*
 and *acoma* limestone, some
 probably from fossils exposed.
 Then for a very long distance,
 the upper highly fossiliferous
Cynthis area full of bryozoans
 is seen from a long stretch.
 At the highest point, at 234,
 the lower *Eden* limestone
 mixed with shaly sandy
 layers is seen, full of bryozoans
 in some of the clay layers.

235. *Strophomena*, first above RR
 level.

236. *Tetradium*, *Rhynchotrema*,
Helvetella fragments and
Hemitoma fragments.
 = Rock below the Perryville bed.

237. Iron rock? Or not?

238. *Prasopora* *simulatrix*

239. *Prasopora* *simulatrix*

240. *Prasopora* & *Rhynchotrema*

241. *Helvetella* fragments and

242. *Helvetella* & *Dalmanella*

243. *Prasopora*

244. *Helvetella*, *Rhynchotrema*
hayniana *Lophospira medicinalis*
Vanuxemi *Hemitoma* *Salteri*

245. *Helvetella* fragments and
 from the highest Perryville bed.
 The ground here is same as 236
 and 244.

Clitambites

More fossils
 exposed at

exposed, not studied.
 about 4 mi N of Perryville and
 clay, no fossils.
 clay in the bryozoans
 rock.

rock, with *Galebachia* in lower
 rock.

and top.
 the very upper part of massive
 clay rock with fossils.
 ferrous argill. rock, massive
 shale

at upper layers,

greenish blue l. rock, fossils for
 the

at upper layers.

at first ground with
 sh.

and from massive rock
 clay shale bed.

Section at not measured
 Perryville about 4 mi N.
 along the RR.

Perryville and shale bed.

The road heading from the
 town to the fossil locality
 a *Galebachia* horizon is
 red. Also the very top of
Columbiana area & *Strophomena*
 in some road in the field,
 is seen along the road. This

section should be studied and
 measured.

Ballist. mm

234. From 233 the rock angles
 with the road. At first
 the whole lower Cynthian
 is a very fine fossiliferous
 probably from fossiliferous
 Then from a very long distance
 the upper highly fossiliferous
 Cynthian is full of bryozoans
 & seen from a long distance.
 At the highest land, at 234,
 the lower Cynthian limestone
 mixed with shaly sandy
 layers is seen, full of bryozoans
 in some of the clay layers.

235. *Strophomena*, *Productus*, *Rhynchotrema*,
Leptæna,
 236. *Strophomena*, *Productus*,
Leptæna, *Rhynchotrema*,
Leptæna, *Rhynchotrema*,
 = *Rhynchotrema* *Productus* *Leptæna*

237. Iron rock? Or not?
 238. *Productus* *Leptæna*
 239. *Productus* *Leptæna*
 240. *Productus* & *Rhynchotrema*
 241. *Leptæna* *Rhynchotrema*
 242. *Leptæna* & *Leptæna*
 243. *Productus*

244. *Leptæna* *Rhynchotrema*
hayniana *Lophospira medialis*
Rhynchotrema *Leptæna*

245. *Productus* *Leptæna* *Rhynchotrema*
 full in the highest *Productus* *Leptæna*
 fine grained *Productus* *Leptæna* 236
 and 244
Leptæna *Rhynchotrema*
Productus *Leptæna*
Rhynchotrema *Leptæna*
Productus *Leptæna*

246. Fine exposure, not studied.
 247. N of *Ophelia* 4 mi N of Richmond
 2 ft bluish clay, no fossils.
 2 in bluish clay in the bryozoans.
 1 ft whitish rock.
 2 1/2 ft clay rock, with *Gabachia* in lower
 6 in hard rock.

Toward top,
 weathering surface. Plat. p. *Leptæna*
 6 ft 6 in, clay rock with fossils,
 4 in fossiliferous arg. rock, massive.
 3 in clay shale
 1 1/2 in sandstone layer,
 7 in clay shale
 12 in fine grained blue l. rock, fossiliferous
 3 in shale
 6 in sandstone layer.
 4 in light fine grained rock
 1 1/2 in shale
 6 in hard fine grained rock
 5 ft regular shale, thin
 base. Internal not measured.
 Plat. p. *Leptæna* about 1/2 mi N.
 along the RR

R -> Lower Richmond shale bed.

248. Along the road heading from the
 pike eastward to the fossil locality
 by 247, the *Gabachia* horizon is
 well exposed. Also the underlying Rich-
 mond. *Columba* area & *Leptæna*
vacans over. *Strophomena* is not
 but was not seen along the road. This
 section should be studied and
 measured.

Merritts ferry, N. end of Red River.

32 ft bluish clay. \angle Clinton ft.

25 ft sandy l. softer fossils common
bryozoans but not identifiable except *Stictella*
accidental no depression. *Platy strophion*

5 1/2 ft. harder sandy l. ledges.

6 in. band sandy l.

26 ft interval sandy l. softer

Tetradium, *Labeclia*, *Columnaria* var. *viridis*

1 ft *Platy strophion*

Stictella

16 ft interval, still level ^{top 2 ft} fossils

Same locality

Clinton

91 ft. Measured vertically

1 ft. Hard l. over

Tetradium

49 ft shale bed. top 3 ft fossiliferous.

5 1/2 ft. Hard l. layers. *Columnaria* only

1 1/2 ft shale layer in part

2 ft covered

Low water in river

Down the river 100 yds

5 1/2 ft measured

6 ft. shale bed

6 in *Labeclia* common

1 ft. shale clay

8 ft. *Plat. ponderosa* *dentata*

2 1/2 ft covered \angle river

Merritts Ferry, Reversed section

Clinton exposure

light blue clay

reddish clay

Stictella, *Plat.*

l. sandy l. + bryozoans, *Heterodonta*

under sandy l.

sandy, softer l.

ma, 12 specimens

Tetradium, *Labeclia*, *Columnaria*

l. *Stictella* sandy layer + bryozoans

l. without fossils. *Platy strophion*

chaly rock. Lower Richmond

light blue clay.

fine l.

shale bed.

Labeclia common.

shale clay

at *ponderosa* l.

Stictella *dentata* at

base.

Stictella *dentata* 1 ft above

base.

hard fine grained. gastropod

l. layer.

covered.

By river, below mouth of

Red river.

Merritt

Merritts ferry, mouth of Red River

32 ft Bluish clay.

24 ft sandy l. softer fossils common
bryozoa but not identifiable except *Heterostella*
occasional no depression. *Platystrophia*

5 1/2 ft. harder sandy l. ledges.

6 in. hard sandy l.

26 ft interval sandy l. softer.

Tetradium, *Labechea*, *Columbiana* var. a.

1 ft *Platystrophia*

Heterostella

16 ft interval, still level ^{top 2 ft} fossils

Same locality

Clinton

91 ft. Measured vertically

1 ft. Hard l. over

Tetradium

49 ft shale bed. ^{top 3 ft} fossils
in mass.

S < 1/2 ft. Hard l. layers. *Labechea* common

1 1/2 ft shale layers in part

covered.

Labechea in river

Down the river 100 yds.

S < 1 ft massive l.

6 ft shale bed

6 in *Labechea* common

1 ft sandy clay

8 ft. *Platystrophia* common. *Labechea*

2 1/2 ft covered ^{by river}

Merritts Ferry, Rivered section

Clinton exposure

27 ft Light blue clay

5 ft brownish clay

Platystrophia, com.

25 ft softer sandy l. + bryozoa, *Heterostella*

6 ft harder sandy l.

26 ft, sandy, softer l.

Syringia, 1 specimen.

1 ft *Tetradium* C. *Labechea* C. *Columbiana*

3 ft fossiliferous sandy layer + bryozoa

Heterostella without gorges. *Platystrophia*

45 ft. shaly rock. Lower Richmond

1 ft light blue clay.

S < 1 ft massive l.

6 ft shale bed.

1/2 ft *Labechea* common.

1 ft shaly clay

8 ft *Platystrophia* C.

Labechea at base.

Rhynchotrema dentata 1 ft above
base.

1/2 ft Hard fossiliferous gastero-
pod layer.

2 ft Covered.

By river below mouth of
Red river.

College Hill. East of 1 mile.

(T believed to be equivalent of
Columnaria horizon at
Merritts.)

Chinle.

38 ft. Light colored clay

20 ft. well bedded rock

Grad. going up

Good exposure at head of

T > 28 ft. Well bedded rock to point

22 ft. shaly clay rock

44 ft. No fossils.

Light clay with flat sponge.

7 ft. clay rock.

2 ft. clay rock. Harder. Plat. ponderosa.

2 ft. clay rock, softer.

1 ft. greenish gray fine grained.

1 1/2 ft. greenish blue fine grained.

11 ft. shale.

7 ft. clay rock.

2 1/2 ft. clay rock. Plat. ponderosa.

5 1/2 ft. Hard arg. rocks with

Plat. ponderosa rather

common. Below is Chinle

rock.

18 ft. upper Chinle dark colored.

Plat. long rather com.

Barroisella common at top.

Barroisella.

Ridgeway Reservoir hill section
250 E of Reservoir

Lower Ridgeway

Light clay rock. Basal Ridgeway

2 ft. spalling clay rock.

4 ft. hard blue limestone fossils.

1 ft. very dark shaly rock.

2 ft. hard dense limestone.

2 ft. thin layers pink & purple

1 ft. very dense blue limestone.

11 ft. shale bed, lower half

6 layers as well as shaly.

Upper half is more sandy.

3 in. half l. Plat. ponderosa.

1 ft 3 in. fossiliferous clay rock.

17 1/2 ft. base of greenish part

NE of reservoir at point far

ther east along strike.

Plat. ponderosa occurs l.

5 1/2 ft. fairly exposed. Partly

shaly similar to above.

3 ft. dense colored l.

road leads off N.

251. Marion Nentz locality. Bridge 54.

Plat. ponderosa C and D abundant

to top of section, down to

10 ft. above R.R. A short dis-

tance below, a more argilla-

ceous rock comes in with Rafin-

osporus C, and a few Platy-

strophia. This lower rock

appears argillaceous and thin-

bedded.

252. Wheelock station, bridge 52.

Same argillaceous rock as at 251 but

with thin rough limestone interbedded.
Also *Platystrophia* Hall.
Westward this argillaceous
section continues to expose
Rafinesquina in great abundance,
a few elongated *Hebertella*
rather coarser than *Hebertella*,
and *Platystrophia*.

253 Bridge 49
Road - public - crosses here

254 Bridge 46
A gravel road crosses here diagonally.

255 Bridge 42
Rafinesquina very common,
Platystrophia, *Crinellaria*
common.

256 East of Hayden Bridge 43
Top not seen
15 ft. *Hebertella* *Cynthis*
17 ft. *Strophomena* *Cynthis*
6 ft. granular massive l.
RR level.

A short distance west of Hayden
is a fault with Eden displaced to
RR level, full of fossils and
by a *Strophomena* *Cynthis*
Cynthis.

257 Clay Miller mill. West of here
exposures are more common, *Cynthis*
the most common from west.

ye 39. at Osgood
2 mi E of Valley
Here Lexington top
above RR level.

Cynthis several } 4 1/2 ft bed on
which quarry top of Lexington
is at level.

ss. *Strophomena* *Cynthis*
rough limestones. The *Cynthis*
common in bedded
rock.

Large house on NE
chula
corner of Tate layer quarry
from here
is a *Strophomena* *Cynthis*
a *Strophomena* *Cynthis*
a *Strophomena* *Cynthis*
a *Strophomena* *Cynthis*

2 1/2 ft sh. l.
1 1/2 ft massive clay with
46 1/2 ft shale, from Richmond.
10 White clay at base of Richmond fossils
2 ft *Strophomena* *Cynthis* with *Strophomena*
at base and also *Cynthis* from top
Platystrophia *Cynthis* 1 ft down
2 ft clay rock,
3rd l. with *Platystrophia*.



with thin rough limestone interbedded.
Also *Platystrophia* etc.

Westward this as well as the
section continues to expose
Rafinesquina in great abundance,
a few elongated *Hebertella*
rather coarser than *Hebertella*,
and *Platystrophia*.

253 Bridge 49
Road - public - crosses here

254 Bridge 46
A gravel road crosses here also
generally.

255 Bridge 47
Rafinesquina generally common,
Platystrophia, *Crinoid* etc.
prominent.

256 East of Hayden Bridge 43
Top not seen
15 ft. Harder *Cynthis*
17 ft. Soft as full bedded *Cynthis*
6 ft. granular massive l.
RR level.

A short distance west of Hayden
is a fault with Eden exposed to
RR level, full of small *Cynthis*
by nearly fossiliferous *Cynthis*.

257 Clay Miller mill. West of here
exposures are much more, *Cynthis*
the same than from west.

258 Bridge 39. at *Prophet's*
church, 1/2 mi East of Valley
River. Here Lexington top
is 13 ft above RR level.

259
{ *Strophomena* several } 4 1/2 ft bed on
{ *Dinorthis* *viridigera* } top of Lexington
{ *Rhynchotrema* etc. } etc.

260

261 Gardner's.

262 Bridge 66. *Strophomena* *Weyershausen*

263 Scambrugh house. The *Cynthis*
williamsi common in westward
along RR track.

264 Bridge 68. Large house on NE

265 On *Rhynchotrema*

266 Large exposure of Tate layer generally

248 Second visit to west from here
R> *Strophomena* *planumbona*, probably
in place. *Strophomena* *vagans*
4 ft { *Weyershausen* form.
{ *Strophomena* *planumbona* etc. 5 ft etc.
2 ft hard l. granular *Platystrophia* *Hebertella*
2 1/2 ft sh. etc.

1 1/2 ft. More massive clay with
46 1/2 ft shale, from Richmond
10 White clay at base of Richmond fossils
2 ft hard l. clay with *Strophomena*
at base and also *Cynthis* from top
Platystrophia *planumbona* = 1 ft down
2 ft clay rock.
3rd l. with *Platystrophia*.

1/2 ft clay
1 ft fossiliferous layers
3 in. *Rhynchotrema dentat* at a, highest
place.

17 ft bedded with clay is, clayey
sandy, hard, thin, a little
Streptelasma vagans.

rather common in lower part
of *perforatella* flat, clay,
Rhynchotrema flat, like

3 1/2 ft hard sandy layers with
2 ft softer sandy clay.

2 in. bed of sandy rocks
R 4 1/2 ft sandy layers + *Rhynchotrema*, clay,
Streptelasma vagans begins

Interpretation.
31 ft middle *Rhynchotrema*
2 ft massive l.
5 1/2 ft lower *Rhynchotrema*
6 ft down to

dentate layer.
The *Rhynchotrema* probably belongs at

Below Rock, S of Bertha 3 miles

ss. *Atrypa* common.
pellets only in the upper 10 ft.
common, but begins to be in
and with *Atrypa* *groggiana*
with numerous *Atrypa* *groggiana*
large blocks of granular l.

38 ft interval with numerous
33 ft looks like St. Louis l.

fine grained l.
22 ft fine grained l. like St. Louis
all in situ

25 ft white l. in situ.
13 ft St. Louis appearing, with 2 ft
white at base, possibly dropped

20 ft St. Louis l. fine grained
5 1/2 ft *Atrypa* *groggiana* l.

Cherty l. full of *Atrypa* *groggiana*
22 ft heavy, in place.

3 ft *Atrypa* *groggiana* St. Louis type,
2 ft soft, green clay in place

5 1/2 ft massive yellowish rock, cherty
7 ft. greenish soft clay in place
8 1/2 ft massive yellowish rock

6 in. sand greenish 1/40 in. thick, granular
16 ft yellowish rock, granular. Looks

3 1/2 ft interval - ss.
spring
massive ss.

S W of Livingstone, Ky.

In reverse order.

Pentamerites papiriformis
Agassizosites (gradini) } white
P. b. b. b. } limestone
Archimedes } Top of
Productus chertensis } Newmant.
Strophomena ?

Dalmanella } 20 ft thick, more
Chonetes small } fine grained l.
Some of the layers
weathering shaly,
= Perminian shale

10 ft D. and A.

See so. formation.

Coal outcrops about 50 ft up
hill, but not well measured.

Danville, Ky. Valley

O. chertensis l. base.

2 ft. granular l. with *Vannosia* and *A. b.* in
upper half.

2 1/2 ft. granular l. *Vannosia* and *A. b.*

2 ft. whitish granular l.

2 1/2 ft. grey granular l.

5 ft. darker, finer grained l.
fossiliferous.

R 10 ft massive l. *Agassizosites*

1 ft. soft l.

1 ft. clay.

2 ft. 3 in. massive l.

1 ft. 3 in. clay.

1 ft. 3 in. massive l.

1 ft. 9 in. clay.

1 ft. 9 in. massive fossiliferous l. & m.
at base, most fossils found in l. here.

7 1/2 ft. *Productus* fossiliferous clay.

2 ft. limestone & clay interbedded.

1 ft. 9 in. massive l.

1 ft. 2 in. limestone & clay interbedded.

1 ft. 3 in. massive l.

1 ft. 6 in. limestone out exposed.

1 1/2 ft. limestone, with a full of
fossils. Top of Permian l.

8 ft. massive, *Productus* chert-
ensis. *Pentamerites* large than
ordinary *P. gradini*.

2 miles N of Shreve
Valley.

1 ft. massive. Top of gray.

6 ft. massive yellowish rock.

1/2 ft. soft clay.

1/2 ft. hard yellowish rock.

Shale.

7 ft. soft clay with several thin beds.

1 1/2 ft. spalling yellowish rock.

2 ft. hard rock.

1 ft. hard clay rock.

2 1/2 ft. soft clay.

1 1/2 ft. soft spalling yellowish l.

2 1/2 ft. harder yellowish l.

2 1/2 ft. soft yellowish spalling l.

R

1/2 mi S. of Alcorn Ky. road
1 1/2 mi S. of Taterville.
Chert base.

24 ft Massive l. bluish, fine grained
and medium grained. Some
large *Pentamerites pygmaea*.

20 ft about / Obolite l. *Archimedes* l. ex 10?
Agassizianus C. *Pentamerites*
pygmaea large. C. The measure-
ment was made along a long
stretch along the railroad.

The fossils are found chiefly
in upper 5 feet. Very large
around slopes at base.

6 ft granular with *Martini*
glabra C.

3 ft fine grained dark l.
with *Martini glabra* C. And
some small *Pentamerites*, one
is of *pygmaea* type but small,
"elegans"?

2 ft obolite l. with *Pentamerites*
elegans C.

2 ft Rock like St Louis glau.

Apparently there is con. with
calation of rock to be St Louis
and of granular rock with
Pentamerites, at least as
far north as the cut N. of
Taterville. Here large *Platystrophia*
pygmaea is found.
1 mi. N. of Taterville in a
obolite l. section 20 ft thick at base.

St Louis valley.

Abundant action.

6 ft Massive yellow rock.

20 1/2 ft chiefly clay

10 ft Massive l. *Agassizianus*

28 ft Clay + l. fine grained

24 ft Massive l. bluish, fine grained

20 ft about obolite l.

< 6 ft granular *Martini*

3 ft fine grained *Martini*

2 ft obolite l. *Pentamerites elegans*

S. of Bensenville. Ill.

Obolite rock Mass

< Cincinnati 166 miles

4 ft 3 in. Bedded l. ^{not in a gully?}

→ 1 ft ss. apparently ^{partly in bed}

9 ft very white massive l. No fossils

10 ft Bedded l. *Syringopora* 4

3 ft Lithostrotion hexagonal Chert

2 ft dark granular. *Syringopora*

1 ft thin bedded very cherty

1 ft Lithostrotion hexagonal

10 ft chiefly granular l. fossils

2 ft Boulder layer. *Syringopora*

20 ft St Louis

9 ft l. + granular St Louis

deposit at Bensenville

267. *Hebertella brevis*
 268. *Rhynchotrema c. Praegeri*
Hebertella parvifrons
 269. Richly fossiliferous rock below
 the zone. Perryville.
 270. Chert, apparently St. Louis
 but no fossils.
 271. Lithothion hexagonal &
 cylindrical in chert.
 272. Rapid westward dip. Farther
 west there is Lithothion
 cylindrical in place, in a very
 cherty granular ls. varying
 a much less cherty fine
 grained ls.
 274. *Spirifer like Martinia*
 in being nearly smooth - Harrods-
 burg type, also St. Louis?
Pentamerites considered near
 middle = Cummins Station
 275. Lower part of the over and away
 Section. NW of Maestling Ky.
 5 1/2 ft fine grained cherty ls.
 Lithothion hexagonal.
 5 1/2 ft fine grained ls. + few *Spirifer* spines
 5 1/2 ft less granular ls. great coal ref.
 4 ft granular ls. + little chert.
 7 1/2 ft top of fine grained ls.
 5 1/2 ft soft ls. weathering shaly.
 2 ft Hard ls.
 4 ft soft ls. weathering shaly.
 8 ft massive + contorted ls.
 passing to clay.
 2 ft ls. laminated bedded paper-weather-
 7 ft fine grained ls. soft + spalling
 down to 1921.

- 13 1/2 ft. *Hebertella* ls.
 4 ft softer shale. - shaly ls.
 2 ft Harder fine grained ls.
 { together. Cummins section
 as regular deposition but hanging
 4 ft Massive fine grained ls. thin bedded
 1 ft weathering soft.
 14 ft granular ls. Spenser + Pontian
 ls. Considerably crossbedded ls.
 2 ft 6 in soft blue clay.
 { in lower half,
 with large red cherty con-
 1 1/2 ft indurated chert like rock.
 6 ft soft blue clay.
 1 ft. Yellowish spalling rock.
 5 ft. Rather coarsely granular ls. in the same
 large *Urbn* stems, large *Zaphrentis*
 small *Spirifer*. = Harrodsburg ls.
 { the Harrodsburg section, perfect
 places. Regarded as belonging to
 the underlying rock, at least in
 like indurated chert like the one
 6 ft (similar) spell north rock, but more
 10 1/2 ft Shale ls. yellowish ls. but probably
 in limestone with chert nodules 1 ft above base
 1/2 ft greenish coarse clay rock, pebbles
 17 ft Cherty soft blue clay shaly.
 { indurated. but probably is siliceous
 with a few gl. *Urbn* flint masses
 4 ft siliceous nodular chert like
 in masses included in Harrodsburg.
 5 ft Lenticular banded nodular
 25 ft More indurated chert like
 L 124 miles.
 40 ft Spalling clay shale. Harrodsburg.
 - Base of section at loc 277

276. Rem'date top of St Louis followed by whitish Celara which near base has small shells suggesting Spargen types. The rock is volcanic near the base.
277. Fine grained l. well bedded, covered by volcanic l.
278. Great thickness of volcanic l. at least 25 ft thick.
279. Lithology cylindrical
280. Two feet of Spargen which here contains quartz granules up to $\frac{1}{32}$ inch, but very few fossils and these not characteristic. Recognized by theologically by comparison with the lower section - 100 ft N.S. & S.
- 4 ft soft clay
- Reddish quartz in chert nodules, such as occur at top of Harpersburg section at Marketburg.
281. No trace of Spargen.
- 4 ft soft clay
- ← Top of reddish chert nodules layer
- 3 ft interval from top of chert layer down.
- $\frac{1}{2}$ ft l. = Harpersburg
- 5 $\frac{1}{2}$ ft interval
- 1 ft ← considerable chert, probably in place.
- 50 ft interval in the solid limestone ledge about 3 ft thick near middle, Road level.

- Lansford.
282. 3 feet of freestone about 2 ft above plaster level.
- At a higher level, on the south face of the tunnel cut, an upper freestone, much thicker, shows in
283. Here the upper freestone of loc. 282 which is about 8 ft thick, comes down to rock level.
284. Great thickness of St Louis at tunnel $3\frac{1}{2}$ ft more massive l.
- R 5 ft massive arg. rock and chert nodules
- 1 ft soft layers, weathering clayey
- $3\frac{1}{2}$ ft massive rock. Spargen Reichenbach
- 9 ft massive rock, crinoidal + fossiliferous locally and irregularly as in Harpersburg occasionally or in upper Harpersburg + *Platystrophia dubia*, about yellowish rock.
- R > No trace of Spargen here.
285. Narrow gap road to Big Hill, 6 in Sandy base of St Louis with 2 and grains $\frac{1}{32}$ in diameter = Spargen
- 8 ft interval = yellowish rock reddish nodules for deeper and masses, a time as below other Spargen sections.
- No trace of Harpersburg nor massive sandstone.

286

Bill Hill Road to Merrill.

- R> 11 ft chiefly yellowish rock.
 1 1/2 ft fine grained limestone.
 4 1/2 ft Harder above. Softer below.
 6 ft Hard massive above. Soft clay below.
 7 1/2 ft Harder above. Softer below.
 2 1/2 ft Hard rock.
 2 ft Softer rock.
 2 1/2 ft Harder rock.
 4 ft 3 in Soft l. Lowest part clayey.
 14 1/2 ft Yellowish rock. Chert nodules at top.
 + + + + +

- S> { top
 both top and bottom. Sandy at
 at base + Pentamerites small at
 8 ft oolitic at top with minute shells
 19 1/2 ft oolitic at base = Electronia.
 3 in. { - Pentamerites }
 { Sandy conglomerate at top of 45 ft }
 31 ft St Grouse.
 4 1/2 ft Lithology cylindrical crinoid
 crinoid heads.
 7 ft Limestone gray with few large

R>

T>

- sand limestone
 2 ft { Similar fine grained clayey layer
 (chiefly radiate at top)
 3 ft { fine grained l. On top of 2 ft
 8 ft { Somewhat coarse grained l.
 11 ft fine grained l.
 S>

U>

- Top of Chert exposure.
 17 1/2 ft Limestone chiefly
 8 1/2 ft Not exposed as cap clay
 at base which may make up
 (mostly radiate)
 27 1/2 ft Limestone. No exposures.
 Some blocks of l. in the Agassiz
 shales probably came from
 here but may have come
 from higher up.
 30 ft Drift soil. No exposures.

T>

287. Point Dick trip. Tate layer.
 288. Orthoceras layer, covered
 by Tate layer + Coryville rock.
 289. Sandy Iron Richmond.
 White fossiliferous clay.
Amherst fossiliferous + Leptaena
 Iron Amherst sandy shale.
 Dark colored l. = top of Coryville.
 Iron Coryville with Plat. fossils.
 = Amherst or Amherst rock

Amherst Leptaena 60 ft above
 creek level.

290. Dark colored l. about 15 ft above road.
 Iron argill. rubble l. = Iron Coryville.
 Tate layer in creek.
 291. NW of J. M. Campbell.
 Amherst base at road level + Leptaena
 rhomboidals + Orthoceras dentatus
 1 ft massive dark colored l.
 Regular Iron Amherst shale bed.

292. South of Jerry Russell.
Laticleria. abundant.

5 ft fossiliferous
2 ft Basal Richmond light colored clay
5 ft Oriskany fossils. Leptaena. Plat. ponderosa
5 ft dove colored l. fossiliferous.
13 ft Lower Oriskany shale bed,
upper dove colored Corymbella
down the creek.

293. Lower, thin bedded, impure
fossiliferous Corymbella & Tall layer

294. Alum Springs 12 ft granitic ls.
Tarnish markings in top of
Duffin. This horizon probably
belongs between typical Duffin
layer & Black Shale since the
Black shale is immediately
above and the Duffin layer is
not seen at some spots though
of great thickness at road
angle westward.
The highest indication of
dove colored Corymbella full of
fossils at some horizons, not
dying Plat. ponderosa.

226 / R >

Assumed to be Oriskany
11 ft Oriskany l. full of Oriskany
Assumed to be Oriskany
5 ft Oriskany + Oriskany
Top. May be Oriskany
5 ft Oriskany fairly common at
6 ft covered. Probably soft.
Probably Oriskany l.
5 ft chiefly l. & Oriskany Oriskany
11 ft Oriskany & Oriskany Oriskany
Probably Oriskany Oriskany & Oriskany
Probably Oriskany Oriskany
26 ft Oriskany hard Oriskany or
5 1/2 ft Oriskany Oriskany
22 ft Oriskany Oriskany Oriskany
These collections should be done
22 ft Oriskany Oriskany Oriskany
20 ft Oriskany Oriskany Oriskany
red leaves like Oriskany and grow
rapidly up hill.

Top of Oriskany
20 ft chiefly l. = Oriskany Oriskany

R >

228) SE of Mitchell's Landing

Opposite St Louis house

11 ft shaly l. rubble. with fossils

9 ft different strata

2 ft. rubble with *Strophomena* sp.

14 ft (Bluish) shaly l. with fossils. Age

15 ft. Internal not exposed.

16 ft. Harder l.

20 ft cherty nodular *Knobstone*.

295. (*Strophomena* *striatella*) common
Rhynchotrema

(*Hebertella* *frankfortensis*)
All in 4 ft thickness of rock
at 900 ft level N.E. 5. about

296. Same 4 fossils in 4 ft section
immediately above typical
Perryville bed. at 880 ft.

297. Large *Oryctoloma* form
suggested for *Artibeus* *indus*
Hebertella *frankfortensis*
appears at base of fossil
1 ft. as Perryville where the
large *Strophomena* or
Vernuxensis occur.

298 - 928 ft above sea = top of rock
with *Strophomena*, *Dimorphia*
striatella, *Hebertella* *frankfortensis*,
Oryctoloma. These can be
easily identified with 297
base of fossiliferous Perryville
Strophomena with the
Strophomena layer.

299. *Hebertella* *frankfortensis* and con-
siderable *Mordiana* *Vernux-*
ensis, near top of Hill, asso-
ciated with *Gastropoda* common
and some *Oryctoloma*.
Horizon uncertain. It is Perryville
but somewhat older apparently
is at base of the Perryville fossil-
iferous bed. - at top of Hill Egg Smith Cr.

300. *Cynthis* bed with *Perrinites*
abundant followed above
by sandy bed, with some
l. at top in the bed.

301. Faint *Hebertella* *frankfortensis*

302. *Rhynchotrema*. *Hebertella* *frankfortensis*.
Vernuxensis + *Tetractena*
in saccharoidal l. at base of fossil-
iferous Perryville as at locality 299.
The strongly saccharoidal layer is
about 1 1/2 ft thick, but *Oryctoloma*
occurs 1 ft down, also *Gastropoda*, and
this lower rock is saccharoidal locally
and contains *Vernuxensis* thus
raising the saccharoidal layer to
4 ft in thickness locally. Sacchar-
oidal layer also occurs above.

bringing the total at least
6 ft. but it should be remem-
bered that fine grained l.
intervenes locally.

Below the richly fossiliferous
saccharoidal l. from which
so many fossils weather out,
there are at least 5 ft. of similar
stone but with comparatively
few fossils including the same
large *Vermuxonia* as the
lowerlying rock. Also *Sabichia*
at top.

Top of section about 970 USCS

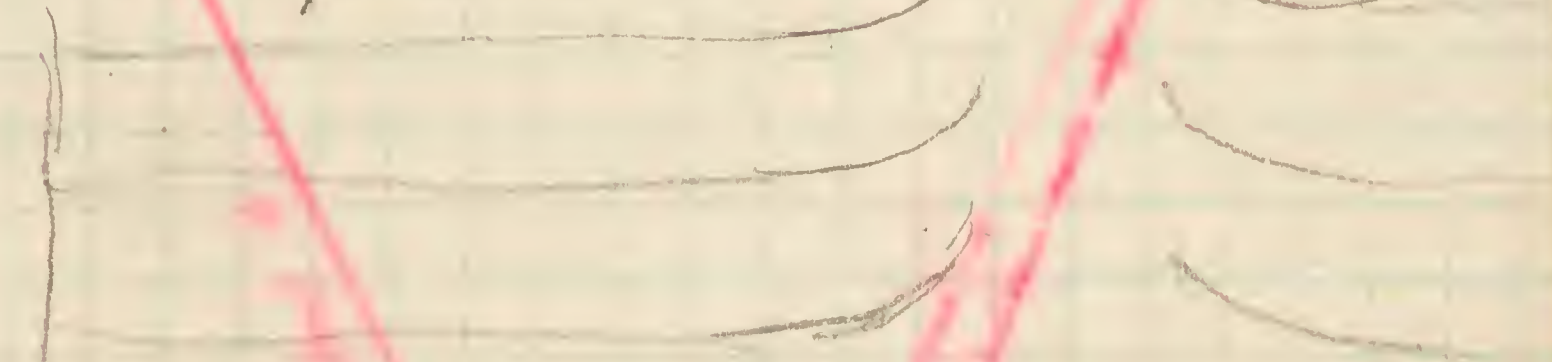
303. Saccharoidal looking l. with
a few *Vermuxonia* and
a grainy sand bed with large
Dalmanella & *Orasleria*? Also
smaller specimens, rather common
vertical valves, and flat double
probably same species as the
large *Dalmanella* specimens.

304. Richly fossiliferous. *Orasleria*,
Helictella from plications that appear
at first but are in fact of same
species. Also typical *Orasleria*,
Zygospira, *Pemilia* species, and
crinoid bases. *Orasleria* and
Helictella. *Dalmanella* fertile.

305. *Orasleria*, *Helictella*, *Dal-*
manella, *C. = fertilis*.

306. *Yugonia* + *Murch.*, *Helictella*, *Orasleria*,
Dalmanella fertile. Numerous
molds of fossils in layers interbedded
with the fossiliferous layers.

Large *Andreas* 4 in wide.
Siphuncle 1 1/2 in wide. Chambers =
10 in 3 inches. Siphuncle + on the
wall of outer shell and the septa
turn up there =



Cerasurus.
Bathys?

Dalmanella apparently. The
lens on head collected for pits.
307. Repetition of *Yugonia* section
about 5 1/2 ft thick, overlain
by richly fossiliferous zone at
base of *Orasleria*, full of *Dal-*
manella fertile. The top
of the underlying rock is fairly
well impregnated with *Dalmanella*
& *Orasleria*. At this lower section
the top 13 feet are exposed. The
typical *Cerasurus* bed occurs
at 308 after a long stretch
along the road. Interval
at least 6 ft. bringing the top of the
Cerasurus 19 or 20 feet below
the base of the typical *Yugonia*,
as well as I can make out.
308. *Cerasurus*, 8 ft. exposed here.
Orasleria on top with deep orange
Vermuxonia in brown part of the
locality.

309. Fossiferous Curdsville under-
laid by about 5 ft of well
bedded, sandy looking lime-
stone with few fossils, and
5 ft of more massive bedded
l. with chert at base at 310.

310. Chert at base of Curdsville
- 4 inches thick.

311. Curdsville limest. with *Orthis*
inornata and *Dinorthis*? Look up.
I mean these and *Orthis* *orbis*
species.

312. Curdsville base.
White clay about 2 ft.
+ top of High Bridge.

313. Curdsville bed.

314. Highest point in road - Curd-
sville. Stratum below the 850
marks. Look up and over line
with lens.

315. High Bridge.

316. Curdsville. *Orthis*, *Plectrothis*,
Dinorthis, *Rhynchotrema*, *Orthis*,
Plectrothis, *Dinorthis*.

317. *Grogona* in place.

30 ft. interval.

Richly fossiliferous Curdsville
15 ft interval
Culvert.

7 ft interval
High Bridge.

Prasopora *lanceolata* occurs
with plenty of *Orthis* *orbis*
directly over the *Grogona*.

South of 317 there is a rather strong
Northward dip where a Southward
dip was expected.

318. Most of *Orthis* *orbis* is a strong
acrossward dip where a westward
dip was expected.

319. Curdsville chert abundant at
about 900 ft as far as can be
determined from the cut on line
66 ft. below the top of the hill west of
the pond. This would give 884 ft
for the Curdsville chert.

320. *Orthis* bed with probably the
Curdsville bed beneath. The latter
not well exposed.

321. Top of High Bridge with probably the
Curdsville chert below 6 ft below
road level in front of house. The
house level is a little less than 900,
probably 880, and the top of the High
Bridge may be about 870. All of
this is increasing from cut on line.

322. *Prasopora* *lanceolata* 1 { 807-
Orthis *orbis* 1 { 809-1150
Orthis *orbis* 1 { 809-1150
Orthis *orbis* 1 { 809-1150

307-815. Separation in chert in situ in rock
at 815 ft. *Orthis* with scattered fossils
of chert. Not certainly determined
as to date.

at 835-838 ft. High Bridge
815-818 ft. *Orthis* *orbis* in chert
under road at 815 ft. *Orthis* *orbis*
at 815 ft. *Orthis* *orbis* still exposed.

323. Columnaria in situ about
6 ft below the richly fossiliferous
horizon, therefore about
800 ft N.E.S. accurate. This
is the first Kentucky Columnaria
in the High Bridge. The Ky. month
horizon belongs here, or possibly
if it is represented by the thunder
layers of the thunder fossils.

324. Chert layer at top of High Bridge
5 ft below road but when road was
and 70 ft below top of hill above
road.

$912 + 17 = 929 - 70 = 860$ ft for accurate
height of top of High Bridge.

325. Chert layer at top of High Bridge
from house along road to where road
turns directly west. Road about 850
ft long from contour lines.

326. Chert layer at top of High Bridge
about 860 ft long from contour
lines.

x 16A - Bathyron apparently in Kentucky
available. Bathyron is not bedded
bedded but not measured.

327. Top of High Bridge, Kentucky month
bed at 719 ft N.E.S. accurate.
Sag pond to be same bed as at 16A,
West of Mendon, west of Dix river,
in Davidson county.

328. Some large Columnaria fossils for last
half mile. Also half mile
N.E. of the thunder, where a fault
is located there.

329. Top of High Bridge about 8 ft above
below house level before road.

Across east road to River road.
A Columnaria bed is 16 ft above
the base for water supply of thunder.
Bedded with 2 ft water holes
in succession up above. Keep up
water supply recently, and the next
week will be in new thunder.
Up to the base of thunder. Water
supply hole back 3 1/4 mi. thunder
of thunder down in many thunder from
spread of thunder stream and the
big thunder in thunder was
where they 1 ft at the down.
Some with high thunder its the
place where the thunder is thunder
from above the thunder, only the thunder
below.

330. High Bridge with thunder dips
southward, with thunder north
up above the valley north
ward. Look for a thunder down
down and down here.

331. Top of High Bridge 10 feet above the
road level.

332. Top of High Bridge in front of
house. So then a fault here with
High Bridge in North & Lexington
in south. Apparently a thunder
and a long thunder dip along
the road. Look up surface of thunder

152 2 ft interval with thunder scattered over
7 ft interval. thunder was down
9 ft interval. thunder. Probably
surface of thunder thunder.
11 ft arg. thunder to be thunder thunder
but thunder thunder on ground.

5 ft interval, much as
typical dove colored limestone

The preceding section is very poor
or somewhat the same of
the layers being uncertain
but it is certain that the strata
forming regarded as, Mr. Anthon
in strata, are Anthon with
the Devonian. More over the Devonian
in limestone comes in within
5 ft of the top of the section as
here described. If not directly
in top.

The large bryozoan, *Crinoid* derived
Anthon in form, but comes
in in the 11 ft argill. limestone
section at top of the Coryville
Lebanon, Ky.

- 154 Near Sulphur Well, Lebanon.
Tetradium 9 in below Devonian l.
Columnaria vacua 1 1/2 ft below D.L.
Col. vacua, 3, 2 1/2 ft below Devonian.
Columnaria rather common between
1 and 2 1/2 ft below Devonian l.
6 in arg. rock with vertical *Baccharis*
common, like a carrot with forked
end down.

159. Down steep hill S of Sulphur Well,
Nodule layer.
9 ft from top = Anthon.
Rhy. dentata + *Leptaena* loose,
7 ft lower. This shows that
Lower Waverlyville Nickel was Anthon
here at least.

- 159 not large globular Plat. but not from same
2 ft rich fossil. clay rock with
60 in. subcriniform clay rock, soft.
32 in. Plat. *ponderosa*.
24 in. rich fossil. + Plat. *ponderosa*.
30 inches fossiliferous l.
Leptaena in place.
7 ft. 8 ft arg. rock.

- Regular dove colored l.
Shale layer of Waverlyville.
4 ft arg. rock.
1 ft Nodule layer,
an undulating fossil. rock. Waverlyville.
2 ft rich fossil. limestone thus

- all of preceding agreed S of Lebanon
thru upper settlement.
333 George Luckett, about 1/2 mile S
Lebanon - Bradfordville pike.
Plat. *ponderosa* abundant, as far
as west number.

334. 33 are of Tate layer, Devonian l.
160. 49 ft Shale layer Waverlyville.

nodules in whitish blue soft clay
16 1/2 ft interval.
Leptaena loose, just above
argill. rock, softer, which
includes typical dove colored l.

The Devonian l. is just above the 49 ft
of Lower Waverlyville.

5 ft along bridge

.2 + .8 depths, add + 2

.6 then that is impossible,
= mean.

8 at surface. With wheel of
meter just below water,
multiply this by .9
= mean.

meter can be placed below the
weight.

For mean velocity divide $\frac{\text{Total Discharge}}{\text{Total Area}}$
Use bank mark on bridge
and measure from bridge.

In case of freshets use 10 ft or 15 ft interval to get across
section quickly.

Find angle of water to bridge.
Corrections must be made
with bridge vertical.

Current on rising stage is greater than on falling stage.

New York Standard Watch Co.

Fortknock or
Locks.

Wolf Cr.

Greasy Cr.

Riverina

Kindle 3 mi. S. of B. M.
Creston.

Strophomena retrata

Wesbury, Liberty

top of Waynesville

Ballston top of Liberty

N of Lenoirshurg Ind. p. 109. Liberty

Bed B in Cauden top of White water

Strophomena halli

Loc 32 Middle Eden

Loc 51 Middle Eden

Strophomena planumbona

Wesbury, Liberty

top of Waynesville

Ballston top of Liberty

N of Lenoirshurg, Ind. p. 109. Liberty

Stroph. mayonillensis

End of main Bondett fork R.

Loc 23, Lancaster, top of Fairmount

Loc 26, Fairmount, to Lancaster, Fairmount

Loc 34 "

Loc 49, Fairmount

Loc 50 "

Loc 69

Loc 70



Grando. When jacks are trump
 20 out of hands not
 picking up the Skat
 16 If taking up Skat
 12 If trump is changed
 to grando.

12 11 10 9 Solo.

8 7 6 5 Turney

Nulla.

20 played out of hand

20 when taking up Skat
 but loose 40

Nulla overt
 played out of hand
 make 40 and loose 40

with skat.
 make 40 and loose 80

Same

Schneider

Schwarz

make 61

make 91

make 120.

1 extra

2 extra

If you announce Schneider before
 playing it you get 1 extra pt.

Schwarz. 2 extra

J — 2

A — 11

10 — 10

K — 4

Q — 3

9

8

One black J 10.

12

14

16

Two black J.

Deal 3

2 skat

4

3

The cards you discard count for
 you

Bald Point? near West of
Claretum, 31 ft below Bellerose
= 46 ft above Str. majorillian
Zone at base of Foraminif.

Leptocarpus

Monday, Liberty near base
Waycross to the top

Best Bm Consider triple Whitewater bed
Loc 43. 5 g. laminae

Silphium laciniatum, voluta

W. is. l. 9 ft. above Shale bed
and 11 below Whittell bed in Galena
Bed B, in Lincoln Co. top, White mts

Strophomena planicureta
 1 $\frac{3}{4}$ mi West of Verona, $N = 27 \frac{3}{4}$ miles
 from Cincinnati, above.
 Plect. neglecta of Mt Hope?
 11 ft above Allendale Sta. above,
 100 yds west of station.
 13 ft above base of section at Clay
 Bank west of Allendale, p. 91.
 Loc 34. Lancaster Ky.

Strong men may kill us

Geni E of Alameda Sta. where road crosses
R.R., associated with the *Platanus*
neglecta, *Dalmanites* ventral side
Platystrophia profunda and other
= Mr. Hops.

Bald Point; 1 mi. N. west of Seelyham
Wp = 77 ft below top of Fallowville
or below Baldpate base. =

at base of T section point = 7 ft thick

65 ft from base of massive steep
massive limestone to
road 1 mile East of Lomburg
Virginia. Below middle
and below the same locality
loc. 10 - see G. & J. p. 79

Hamilton school, 2 in out of
Berkshire, page 81.

Loc. Creek 4 1/2 mi. out. 55 to 66

4th below top of road, bearing
limonite scale of *St. magnifica*

380 ft above River at Fenton.

Hy? see page 84. *De la*
the multi-angled common with
mediums below.

Oct 25. Billed, No. 913.

5 half tones.

East of Brassfield, limestone.
East of Brassfield, near,
Brassfield L. W. of Paudin
Plum creek,
Dev. Brassfield,

Lexington, Ky.

Treasurer's check No. 551 for \$4.00
on the account of Jan 3rd.

1 zinc etching	—	\$ 0.75
2 zinc etchings	—	\$ 3.25
		<u>\$ 4.00</u>

Jan 5. — No. 2047. \$ 17.00

3 H. Tones. fossils 2 mm size
Silurian fossils.
plate brachiopods
plate Favosites
plate Syllia ordinary.

Oct 4 Billed,

Sept 28 — No. 618. \$ 1.75

1 H. Tone View.

Man standing by fence,
Lulbeys creek.

Sept 22 — No 538 14.25

Sept 27 Billed

4 Half Tones. Views.

Lexington plain.
Dev. W. of Clay City.
Orvine. Castle Springs.
Indian Field. Clinton.

Engr. What we owe.
 May 31 - \$37.20 4 plates of fossils. Cin. Gr.
 June 30 - \$220.10 17 plates of fossils Cin. Gr.
 (Sept 18 \$ 1.25 brk stone)
 Sept 30 - \$14.25 4 halftones. See 538 here
 Oct 31 - 18.95 5 halftones See 913 here.
 Nov. 29 - 10.66
 Nov. 29 (Oct) 1.75 1 halftone. See 618 here.
 Dec. 30 - 72.84
 Jan 31 - 21.00 See No ~~\$4.00~~ + 2047 here
 March 30 - 36.
 April 3. - 11.50

Fly
 Frick
 Sect

S L
 S L
 S L

(Sept 20 cash. 1.25)
 Oct 25 \$257.30 C.J.N.
 Nov. 3. \$18.95 A.F.F.
 Dec. 2 \$34.95 C.J.N.
 Dec 12. Eng. Cred. 4.00 = credit.
 Dec. 14 \$14.00 unknown.
 Jan 19 \$62.50 C.J.N.
 Jan 26 \$4.00 C.J.N.
 Apr. 20 \$47.50 C.J.N.

C.J.N. still owes \$17.00.

71 1/2
 Holmes at Burnside ruins
 garden lamp

Mo

Jun

(Se

Se

Co

A

A

S

Amheim
Mt Auburn 20
Conynille 60
Bellerme 20
Fairmount 80
Mt Hope 50

11 - 35

11 - 35

11 - 35

11 - 40

5 1/2

32

44

11 - 29
11 - 35

20

2

11 - 30

My report to

Mrs T. H. H. H.

Dr. Anthon

Prof. Voller

Prof. Whipple

John Edwards

gre boat new. \$8.00

George Davis 35-407

91 - D

W. H. Hark Sp 52.

G. C. Hales

Danville Ky.

Chicago Lumber Co. ←

Chicago Lumber Co.

Chicago Lumber Co.

Chicago Lumber Co. Chicago Lumber Co.

Chicago Lumber Co. Chicago Lumber Co.

Chicago Lumber Co. Chicago Lumber Co.

Chicago Lumber Co. Chicago Lumber Co.

Chicago Lumber Co. Chicago Lumber Co.

to Chicago

A. C. Stone

other sheet 164 L.
165 L.

following 171. E. L.

F. L.

H. L. R.

~~V. J. Horgan~~ L. R.

~~J. W. Zaaco~~ L.

J. L.

~~S. J. Horgan~~ L.

~~Chicago Lumber Co.~~ L. } see

~~next page~~ L.

~~next page~~ L. R.

~~248 New Lumber Co.~~ R.

289 L.

291 L. R.

292 L.

~~Letting Lumber Co.~~ 152 L.

~~S. J. Horgan~~ 159 L. R.

" 160 L.

